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ISRAEL AGRICULTURE IN RECENT YEARS

MARION CLAWSON[1]

Jerusalem, Israel

During the past few years agriculture in Israel has developed rapidly and has many great accomplishments to its credit; but serious problems still remain, and much further progress is needed before it can be accepted as resting upon a sound economic foundation and as making its proper contribution to the national welfare. The purpose of this article is to trace the accomplishments and to describe the more serious problems.

Israel as a Nation. Neither agriculture nor any other phase of the economy and society of Israel can be considered properly in isolation. Each must be understood against the total development of the state of Israel.

The birth and rise of the new state of Israel is of major importance to the whole world. In the Middle East, where the economy and the social life of most countries are in many respects several hundred years behind the Western world, Israel is rapidly developing a nation, an economy, and a society in the Western image. A genuine democracy, in the political sense, exists and functions. This includes not only free elections, but free speech and the orderly processes of government. Medical care has advanced to the point where life expectancy is substantially the same as in the United States; and the individual is prized, protected, and assisted as in a Western nation. Other social services are well developed also. Education has been unfortunately restricted to a minority in the secondary and advanced grades, but is freely available to all in the elementary grades. Book stores and private libraries are more common than in the United States. And an industry, trade, and economy generally upon the Western model is being developed very consciously.

In this development, agriculture is no major exception. The ideals of a sound citizenry living and working upon the land, with each man profiting from his own toil, with ample food supplies for proper diet of all the people, and with farm people enjoying at least some of the amenities of modern civilization, are firmly entrenched in the minds of the whole people. Closely associated to these ideals is the concept of the application of science and technical knowledge to agriculture. Though the reality may fall short of the ideal, the ideal is high.

To list these favorable, not to say idealistic, aspects of the Israel experience should not blind one to the serious international tensions of this region, which in part revolve around Israel, nor to the serious economic problems of Israel. The country is not economically independent. It relies upon capital from abroad not only for its capital investment but also for a considerable part of its annual consumption, and seems likely to continue to do so for some time. But, in part, this is but another aspect of the effort to obtain the more important parts of a Western mode of living before the economy can support it. The necessary but heavy expenditures for national defense are also a factor. One cannot yet say with certainty that the Israel state will develop an economic base adequate to assure the continuance of the nation; nor can

[1] The author has been a member of the Economic Advisory Staff since June 1953, and has thus had an opportunity to study the agriculture of Israel first hand. The views expressed herein are personal, not an official statement of EAS position. I have tried to describe the agriculture of Israel in terms that I thought would be of interest to American professional agriculturists, and in so doing current issues of policy have necessarily been presented briefly. This paper, however, is not viewed by me as primarily a discussion of policy issues, nor as a complete statement of them, much less as an argument on one side of such issues. I have tried to present only those matters which are likely to be important over a period of years, and to avoid those of transitory interest, however important they may appear at the moment. It is not a highly documented article; a few general references are given, but for the most part I have relied on personal experiences and interviews and upon sources available only in Israel. Lastly, I want to express my appreciation to many agriculturists in Israel who have without exception been friendly and helpful to me, to my associates in EAS for information and counsel, and especially to my associate, Mr. Uri Ariav, without whose day-to-day help I would have been lost.

one say with certainty that the example of Israel, even if it proves completely successful, will be followed or imitated or otherwise have a major favorable impact upon the other countries and peoples of the region.

But one cannot properly examine the agriculture of Israel without a realization that these broader ideals and their implementation, in part at least, establish an economic and ideological framework within which the agricultural programs and achievements must be judged.

Jewish Agriculture in Mandatory Times.[2] In order to understand the significance of agricultural developments in Israel since the state was established in 1948, a brief review of Jewish agriculture during the period of the British Mandate is necessary. Jewish settlers had begun to return to Palestine during the period of Turkish rule, which ended in 1920, and agricultural settlements were established in the last quarter of the 19th and the first twenty years of the 20th century. With the Balfour Declaration and the establishment of a British Mandate over the country, the Jews naturally expected that their settlement of the country would be accelerated and that agriculture would be a major part of such settlement. Their hopes were realized in part, but they suffered many disappointments and frustrations. The Arabs were hostile and the British gradually came to pursue a policy which was neither firm nor consistent. During Turkish rule, opportunities for Jews to buy land were limited, and within a few years the British severely restricted land purchase by Jews. In about one-third of the country, outside of the cities and suburban areas, Jews could buy land freely only from nonresidents of Palestine, or from residents only with specific permission of the Mandatory authorities; in the other two-thirds of the country, consisting mostly of the hills and other less desirable agricultural areas, they were forbidden to buy even from nonresidents without express permission. With such artificial restrictions on the market, the prices paid for land were high—from two to ten times per acre what was paid for much superior cropland in Iowa during the same period, with the margin widening as the years went by. Moreover, such land as was available for purchase was often poor, needing drainage, or clearing, or much other improvement before it could be farmed. By 1943 the Jews owned about one-eighth of the cropland of Palestine. Most of the land had been purchased by the Jewish National Fund, and was leased to individuals or to cooperatives on long-term leases at prices within their ability to pay, usually at annual rentals from one to four per cent of the land's cost.

For the amount of land available, the amounts of labor and capital were adequate. Although immigration was limited by the Mandatory government, some people did come in, and those who were allowed to come were usually carefully selected by the Zionist organizations. In most cases they were given training before leaving their countries of origin. Although often inexperienced in agriculture, they made excellent settlers. Because land was so scarce and expensive, it was sound business to develop the land fully. Generally there was capital enough available for this purpose although sometimes only after considerable delay.

Two other factors conditioned the kinds of Jewish farms that developed during this period. In the first place, the Arab farmers—using small terraces cut out of the hillsides, primitive implements, and getting only low yields per dunam or per acre—grew a lot of grain, both wheat and barley, some of which they would sell. One way the Jewish farmer could enlarge the size of his farm business on the same area of cropland was to buy grain from the Arabs, and thus establish a poultry enterprise or increase the size of his dairy. Secondly, the Jewish farmer, unwilling to compete with the Arab at low-paid hand-labor farming, particularly in growing grains and olives, turned to products that he could sell to advantage on the Jewish urban market. Dairying, poultry and egg production, and vegetable growing became especially important—intensive enterprises, using somewhat skilled labor and considerable capital on small areas of land, and producing fair incomes per farm.

Under the impact of these natural, economic, and institutional forces, Jewish agriculture developed some characteristic patterns, both as to types of farms and as to social organization. Two main farm types developed: the intensive, mixed farm, built largely around dairy, poultry, and vegetables; and the specialized citrus grove, producing largely for the export market. The former was generally small, averaging about 28 dunams (7 acres) per farm family. All, or nearly all, of the grain was purchased, and sometimes part

[2] This section draws heavily upon Robert R. Nathan, Oscar Gass, and Daniel Creamer, *Palestine, Problem and Promise* ([Washington, 1949]).

of the roughage. The available area was intensively farmed, the livestock were relatively high producing, and the livestock manures as well as commercial fertilizers were applied to the land. The climate and soil, especially along the coastal plain, are almost ideally suited to the production of high quality citrus, particularly oranges, at relatively low cost. The area of citrus expanded tenfold from 1918 to 1937. The volume of fruit grown rose rapidly, even though much of the area at any given time was not yet producing. In the prewar years over 90 per cent of the fruit was exported and about three-fourths of the value of all exports from the country were citrus. Citrus growing was generally highly specialized although the average grove was about 22 dunams (5½ acres). During the war, when shipping to the European export markets was cut off, citrus growing became very unprofitable.

Three major types of settlement were developed with several variants. Most of the citrus was in private farms, not unlike the American small farm, except that the operator often lived in a village rather than on his land. Farmers in Palestine, both Jewish and Arab, have traditionally lived in villages rather than on the land, largely for protection against invaders or others, but partly to obtain the social services that are possible in villages.

A substantial share of the citrus groves were owned by Jews who lived outside of Israel and had their groves managed by local farmers. The most distinctively organized farms were the mixed farms. Some were individually operated though often in part with cooperatively owned machinery, and with all buying and selling done cooperatively. Settlements of such farms are called moshavim (singular, moshav). They were typically 28 dunam (7 acre) farms, with part of the land in the village where the farmer lived, and some in other fields nearby. Except for their small size, high intensity, location of dwelling in the village, and unusual use of cooperatives, they were not greatly different from American farms—each farmer was responsible for most of his entrepreneurial decisions.

The most unusual form of organization was the kibbutz (plural, kibbutzim). These are completely collective undertakings, generally varying from 50 to 200 families in size, in which all farm operations are carried on as a single whole. All the people eat in a central dining room and other services such as laundry are in common, children live in separate quarters (though spending leisure time with their parents), and no one is paid any money individually. A full description of this unique form of organization would take us too far afield for the present purpose. One major reason for their creation and success during Mandatory times was their ability to take in the immigrant, give him a sense of group participation, and provide a cultural as well as an economic structure to meet the heavy demands of pioneering in a hostile physical and social environment. Immigrants were carefully trained and indoctrinated, usually in their home country, before becoming members of kibbutzim. In most instances, kibbutzim (and moshavim as well) were sponsored by some particular group, often an association or party with marked political and ideological views. With a major degree of common background, and serving both the cultural and the economic needs of the pioneering period, the kibbutzim were a major force in Palestine during the Mandatory period. Perhaps the best analogy is to liken them to a close fraternal group, rather than to an economic producing unit. Their contribution was far more than economic: often they furnished the leaders for all sorts of social or political activities inside and outside the country. And when war ultimately came, they were in many instances the frontier forts which held the territory for the Jews.

By the beginning of World War II, there were in Palestine about 236 Jewish farm villages, with a total of about 235,000 people. Of these, 90 were cooperatives (moshavim) and 86 collectives (kibbutzim) and the rest were mostly villages of individual farmers.

During the war, citrus producers, both Jewish and Arab, suffered greatly. With export markets cut off for lack of shipping, their incomes fell practically to zero, and they were unable to buy fertilizer, to pump irrigation water, or even to provide the necessary labor. As a result, many groves died and others were severely damaged. The government made loans to preserve the life of the citrus trees, but these were insufficient. The mixed Jewish farms, on the other hand, as well as the typical Arab farms, enjoyed a period of great prosperity during the war. Military establishments provided an enlarged market for agricultural produce; and the same shipping difficulties that plagued citrus gave an incentive to the government and others to encourage local agricultural production. Prices rose sharply and

output expanded, particularly on Jewish farms, so that both gross and net farm incomes rose. The typical Arab Fellah was enabled, for the first time in his life, to get out of debt. Jewish farmers were able to increase their capital in real terms, even with the increased cost of capital items.

Major Changes since 1948. The British Mandate over Palestine terminated on May 15, 1948, and with its termination the establishment of the new state of Israel was proclaimed. During the war years, and more particularly after the war, there had been much unrest and local fighting in Israel, primarily between the Jews and Arabs, though each was fractionalized to a degree. The British had been unable, or unwilling, to maintain law and order. The record of political maneuvers in the United Nations and elsewhere is too complex to be reviewed here. It should be said, however, that no arrangement had been made for continuance of any form of government, except those arrangements which the Jews made through their Zionist organization.

Even before the Mandate ended, many of the Arabs left Palestine for neighboring Arab countries. Apparently not confident of their ability to defend themselves and unwilling to accept a Jewish nation, the Arab leaders left. Seeing their leaders go, the rank and file of the poor peasantry left also. In this they were encouraged in large degree by Arab political leaders, who promised that the Jews would be defeated in battle and driven into the sea, after which the Arabs could come back and possess not only the land they had held before but also that which the Jews had held. As soon as the Mandate ended, fighting on a relatively large scale broke out, uninhibited now by the British. The course of the fighting, the first and second armistices, and related events make an absorbing history which is not relevant to the present purpose.

Suffice to say that, by the end of 1948 or earlier, the Jews were in possession of what is now Israel, a land area of about five million acres, of which about one million acres are now in crops. This included most of the coastal plain area, the upper Jordan and other major valleys in the north, the Galilee, the Negev, the new city of Jerusalem and a corridor leading to it. For the most part, the hill country remained in Arab hands. Agriculturally speaking, by far the most valuable lands of Palestine were now in Jewish hands. The total area of land under control of the Jews increased about 14 times, compared with the Mandate period, and the area of land suitable for crops increased about four times. From a situation of scarcity of land, in relation to labor and capital, Israel now had relatively large areas of land.

At the time of the establishment of Israel, the population was somewhere between 800,000 and 900,000, of whom all but roughly 100,000 were Jewish, although there was naturally considerable uncertainty as who was, and who was not, a resident of the new state. These figures compare with a total population of almost two million for Palestine—a larger area than Israel—in 1946, at which time about one-third of the total population was Jewish. Immediately after establishment of the new state there began a heavy immigration into the new country. The number of arrivals was in excess of 100,000 in 1948, nearly 240,000 in 1949, and roughly 170,000 in 1950 and again in 1951; it dropped to 23,000 in 1952 and to even fewer in 1953. There was some emigration each year, chiefly of unassimilated immigrants, and by 1953 it equalled the immigration. But slightly over 700,000 people have migrated to Israel in the years since the state was established. This compared with about 450,000 immigrants in the 29 years under the British Mandate, and it represents essentially doubling the Jewish population in the country since 1948.

Of the immigrants in these years, almost exactly half came from Asiatic and African countries: Iraq was the largest single source, with over 18 per cent of the total, followed by Yemen with nearly 7 per cent, Tunisia-Algeria-Morocco with an equal number, Turkey with over 5 per cent, and other countries of these regions with lesser numbers. Nearly all of the remainder came from Europe, virtually all of them from central or eastern Europe: nearly 18 per cent from Rumania, 16 per cent from Poland, nearly 6 per cent from Bulgaria, and most of the others from nearby countries. Western Europe contributed but few, and all other parts of the world less than one per cent. The development of Israel along Western lines is thus the more remarkable, since its population owes its origin not to Western countries but to others. However, the earlier immigration had been chiefly from central and eastern Europe. Many of the political and intellectual leaders of modern Israel come from such origins. Although numerically small, the migration from western

Europe, North America, and South Africa has provided intellectual leadership far more important than its relative numbers.

With few exceptions, the postwar immigrants were penniless upon arrival, and the cost of transporting them to the country had been borne in most cases by Israel or one of the Zionist organizations. Many of them were in poor health. Some of them were skilled workers, but many were not, and even those who were often found their old skills of little use. All immigrants were encouraged and aided to learn Hebrew, the basic language of Israel, but many naturally found this slow and difficult. In the meantime the language barrier often retarded their economic absorption. Relatively few of the immigrants had an agricultural background, or were even accustomed to hard physical labor. With the tide of immigration running as high as it did, training of immigrants before immigration, which had been customary through the Mandatory period, was nearly impossible, and training after arrival was often difficult.

The problems of absorbing or at least caring for in even the most basic way, an immigration wave which approximately doubled the population in four years, can be imagined. These difficulties were the greater because in virtually every other sphere the new state was experiencing comparable difficulties. The supply of labor suddenly increased greatly; but the new laborers were not trained and experienced, and many were not enthusiastic about agriculture. But on the other hand they were numerous and they had to find some means of earning a living.

With this great increase in population, the amount of capital available for economic development, in agriculture and elsewhere, was now inadequate, often seriously so. There was a great need for capital for many purposes—housing, essential public services, and even for consumption, as well as for agriculture. The relative supply of land, labor, and capital had shifted greatly, compared with the situation during Mandatory times.

The greatest single change on the land, with the establishment of the new state, was the greatly accelerated establishment of new agricultural settlements. Some settlements had been established each year, even during the periods of greatest tension and the most restrictive immigration and land purchase practices of the British. Agricultural villages, when forbidden, had often been established in a single night, so that the British would the next morning be presented with a *fait accompli*. But once the Arabs had left and immigration was unfettered, the restraints against establishing new agricultural settlements were off and in their place were strong compulsions to establish new settlements. If the land which had been won with so much fighting and such long-continued struggle was to be held, it had to be occupied and the only way to occupy it was to establish settlements of farmers. Some settlements had to be established along the borders or in other strategic places to prevent or minimize infiltration and illegal entry. The new immigrants must have some form of productive employment, and agriculture offered one of the most important and basic opportunities. Moreover, there was a strong religious or ideological compulsion to settle on land as part of the spiritual re-establishment of Israel. Lastly, the new population of Israel needed food which could best be produced within the country. Thus there was an urgent need to establish many new agricultural villages quickly.

In general, the procedure was for the Colonization Department of the Jewish Agency to lay out upon maps "squares," or areas for villages. The size of the square was based upon the assumption of a village of perhaps 70 to 80 farm families, each occupying 28 dunams (7 acres), or a total of 2500 to 3000 dunams (600 to 800 or more acres), for the moshavim, and an approximately equal area for kibbutzim. This size was used where it was expected that the land would ultimately all be irrigated; where it was expected that some of the land would always remain in dryland crops, farm size and hence village size, was larger, sometimes as large as 65 dunams per farm. Wherever possible, effort was made to include different types of land within the village so that ultimately orchards and citrus groves could be established on land well-suited to them, while other crops could be grown on other types of land. The basic concept was a duplication of the types of small intensive mixed farms which had developed under irrigation, although now economic conditions were quite different.

In the kibbutzim, the various buildings were grouped into a single center. In the moshavim, streets were laid out, along which the dwellings and other buildings of each farmer were located. In a typical case, about 10 dunams of cropland would be laid out adjacent to the house, with the

rest located in one or more places further away. One essential consideration was to have the houses located close to each other, partly in order that the village could readily provide the essential social services that were part of its reason for being, but particularly for security and defense reasons. The streets typically followed the top of a ridge, if the land was rolling, and the houses were clustered along it, so that any invader could be seen and would have to advance up a slope. Streets were often laid out in such a way that an invader would be exposed to cross-fire from the various houses. With the memory of the fighting very fresh, and with the very real danger that it would be resumed some day, the planners were acutely conscious of these problems. Army officials advised, and in some cases insisted upon, layouts for security.

In the years since Israel was established the number of agricultural settlements has about doubled, if the Arab settlements which remained in Israel after 1948 are included, and more than doubled if they are not. (See Table 1). Even in 1948, with all the fighting and generally unsettled conditions, 49 new settlements were established. In 1949, the peak year, 126 new settlements were made and in 1950, 119. Since 1950 the number of new settlements established each year has declined greatly and rather steadily. The establishment of new agricultural settlements has roughly paralleled the arrival of immigrants. Although the same kinds of settlements have been established as were found before the state was established, the proportions are different. The number of kibbutzim has increased by about two-thirds, while the number of moshavim has increased by more than one and a half times. The first settlements established were usually kibbutzim, but gradually there has been a shift to the moshavim. At first, there was a backlog of trained and indoctrinated residents and immigrants ready and willing to enter kibbutzim. The glorious achievements of the kibbutzim in the war were still fresh in everyone's mind, and many people were proud to be associated with this form of settlement. However, the new immigrants, especially those from Asiatic and African countries, were uninformed about the kibbutzim, and under existing conditions there was no time to train and indoctrinate them. As a result new moshavim outnumbered new kibbutzim slightly in 1949 and increasingly in later years. Many of the kibbutzim, especially the new ones and even some of the old, have been unable to get members to their full capacity. In addition to the moshavim and kibbutzim, many settlements of a temporary or part-time agricultural nature were established to provide a place to live and at least some employment for the immigrants.

The establishment of new settlements was a responsibility assigned to the Colonization Department of the Jewish Agency. Dwellings had to be erected in the new settlements. These were often only one or two rooms in size, of concrete block or other simple construction, but thousands of them had to be built. To the greatest extent practical, the Colonization Department used the labor of the settler in erecting his dwelling, paying him wages at a relatively low rate so that he would have some income to support his family. The cost was funded into a long-term debt. A few other simple farm buildings had to be built also. Some minimum amounts of farm machinery had to be assembled; at first, a tractor was put into each settlement, but soon these were pulled out and placed in tractor stations, where better service and repair was possible, and from which much larger areas per tractor could be farmed. Mules were made available, usually one mule for each

TABLE 1

Number of Agricultural Settlements According to Kind and to Year of Establishment

Type of Settlement	*Before 1948*	*New Settlements Established in*									*Total Present Settlements*
		1948	*1949*	*1950*	*1951*	*1952*	*1953*	*1954*	*Not Stated*	*Total*	
Town and Urban Settlements	42	—	—	—	—	—	—	—	1	1	43
Moshavim and Small Holders	117	8	63	63	11	20	26	2	—	193	310
Kibbutzim[1]	149	28	51	9	8	3	4	1	—	104	253
Rural Settlements	27	13	12	47	32	7	—	1	13	125	152
Arab Settlements	102	—	—	—	—	—	—	—	—	—	102
Total	437	49	126	119	51	30	30	4	14	423	860

[1] Including *moshavim* where the land is operated *cooperatively as one large farm.*

two or three farmers. Grocery stores for each village, central marketing structures for the produce of each village, schools, and a minimum of other necessary buildings for the service of the whole population also had to be built.

Far more important and difficult were the actions necessary to enable the immigrants to grow crops. Few of the immigrants had agricultural experience or even experience at hard physical work, and even those with some farming experience were unfamiliar with Israel farming. The Colonization Department attempted to maintain an instructor in each village, as well as centrally located specialists, but often could not get able men who knew Israel farming and who were able to teach it to new people. The simplest aspects of farming had to be explained and demonstrated; not only how to plow with a one mule plow, but how to harness and manage the mule—many immigrants were afraid of mules and had had no experience with farm animals. Plowing and other heavy operations were generally done by tractors, with cultivation and the lighter tillage work by the mules. In a great many cases irrigation water would not be available at first, or there would be enough for perhaps four dunams (one acre). On this land would be grown primarily vegetables for home consumption and for sale. On the rest of the land assigned to the village, but as yet unirrigated, grain or hay would be grown during the winter rainy season for harvest in the spring. Each settler or at least many settlers, would be enabled to keep a cow, often starting with a calf and raising it. A small flock of chickens, rarely exceeding 50 hens, would complete the agricultural operations on these new immigrant farms. Even this modest amount of farming was usually not achieved the first year, or even the second. The development has seemed slow, but the need to educate the farmers and the large scale of the settlement activities must be borne in mind. With such small scale farming, many settlers were forced to seek work elsewhere in order to support their families; and in many instances the government or the Jewish Agency had to provide employment near the farm village.

On the whole, this settlement process deserves high praise. It is easy to point to some of its errors; but the scale of the undertaking, the difficult times in which it was done, the need for haste, and the completely untrained status of most of the settlers, made this a most difficult job. In the largest sense, it was successful—the country was occupied, many thousands of immigrants were provided with at least some productive employment, and substantial quantities of food were produced. As will be shown later, the resulting pattern of agriculture is unfortunately not an efficient one, well-adapted to the problems of the future, but changes and adjustments can be made.

Another part of agriculture which has changed considerably since 1948 has been the development of irrigation. In 1948 most of the irrigation consisted of pumping from wells in the coastal plains. Water is found there in a relatively shallow aquifer, and by means of individual wells and at fairly moderate pumping lifts and hence at fairly moderate costs, irrigation water can be obtained. Energy costs have always been fairly high in Israel, but irrigation costs were not excessive, particularly for the citrus groves on which a substantial part of the irrigation water was used. There was some use of surface streams in the Jordan Valley and in the Huleh. In total, perhaps 240,000 dunams (60,000 acres) were irrigated in 1948.

The planning and thinking of the Zionist and other Jewish organizations up to about 1948 had been largely in terms of irrigating individual farms or relatively small tracts of land. The difficulties of buying land naturally led to the irrigation of individual tracts of land, rather than to irrigation of large regions. Plans for major development of the Jordan River had been advanced by Lowdermilk, Hayes, and others.[3] Such plans had mostly included the rather full use of the Jordan River system water within or outside of the Jordan Valley, together with some power development, and also introduction into the rift of the Jordan Valley, and hence into the Dead Sea, of substantial amounts of water from the Mediterranean Sea. The Dead Sea is an important source of minerals, particularly bromine, magnesium, and potash, although only the latter has been developed to any large extent. If the Jordan River were largely or completely diverted, the Dead Sea would fall further and perhaps ultimately dry up, making recovery of these minerals more expensive. Because the Dead Sea lies nearly 1300 feet below sea level, large amounts of hydroelectric power can be generated even after some pumping costs to get water across the divide be-

[3] Walter C. Lowdermilk, *Palestine, Land of Promise* (New York, 1944); James B. Hayes, *TVA on the Jordan* (Washington, 1948).

tween the Mediterranean and Dead Seas, which is somewhat over 200 feet in height. Plans for a full development of the Jordan River system are relatively large scale, and although many experts have pronounced them practical, their consummation would be a large undertaking, even if there were no serious political obstacles to carrying them out.

With political independence, the situation changed at once. It now became necessary for the new state of Israel to have a comprehensive irrigation plan for use of all its water resources and to begin larger actual use of water as soon as possible. Efforts toward the former began at once. American engineers, particularly John B. Cotton and James B. Hayes, as well as American geologists, were used as consultants to prepare a series of reports or plans for the comprehensive development of the water resources of the entire country. In general, their plans call for full use of all water resources, as near the source as possible, with transfer of surpluses to other regions. In their planning, they have been handicapped by lack of adequate data—data which in most cases can be assembled only over a period of years. Their plans have called for two major stages: development of all sources of water except the Jordan, and development of the latter. Their plans provided an early comprehensive report, but more detailed studies were necessary and are being made.

While these plans were being developed, expansion of irrigation was actively under way. For the most part, it consisted of drilling wells in areas where additional water could be obtained, and building pipelines to carry the water to the settlements. An effort was made to get some water to as many of the new settlements as possible, for domestic and livestock use and for limited irrigation. Most of the early pipes were steel, and many relatively small but long lines were built. A type of steel and concrete pipe has since been used for the larger lines. Almost no use has been made of canals to carry irrigation water. In some instances, small pipelines were built to some settlements, with the knowledge that they would have to be enlarged or supplemented within a few years. There has been virtually no increased use of the surface waters; the Jordan is used but little more than before the state was established, and the Yarkon, the second largest river, is not used at all. Construction of a major pipeline for diversion and transmission of Yarkon water is now under way. In addition to purely local lines, some parts of the larger regional (within Israel) schemes have been begun and partially completed.

In all, the area for which irrigation water is available increased to perhaps 800,000 dunams by the late summer of 1954. This compares with perhaps 1,600,000 to 1,800,000 dunams that may ultimately be irrigated from within Israel "regional schemes" which do not include major development of the Jordan, and with probably 2,500,000 to 3,000,000 dunams that might be irrigated when the latter is completed.

Two somewhat different trends and problems have been apparent in the rural society during recent years. On the one hand, the new settlements made up of new immigrants have had the problem of cultural assimilation and adaptation. Their success has been varied. While most new settlers have picked up some Hebrew, which was a new language to many of them, their knowledge of it is far from perfect. They have learned something of scientific farming, but mostly they have learned how to follow instructions, rather than the reasons for them. They have learned something of modern hygiene and health practices, and they have had some contact with and participation in a democratic free-speech society. Those from Europe have generally made far more progress than those from Asiatic and African countries. The children have gone to school, but since most settlements have a single cultural background, the schools have not been as much of an assimilation factor as might be imagined. Since there is universal military service, and since all groups are intermingled, and since the Army has been forced to conduct educational and other cultural activities, the Army is possibly the greatest single force for cultural assimilation in the country today.

The other trend or situation has been the crisis, or at least the difficulty, faced by the kibbutzim. Prior to the establishment of Israel, they were one of the major economic and cultural forces of the country. Their energies and talents were directed toward achievement of political independence and all the associated cultural and social advantages. With the achievement of political independence, one of their major ideological purposes disappeared. The kibbutzim have continued, and are today, highly important in Israel; but they have not retained their dominant role as a social force or as the form of economic organization of agricultural operation. Moreover, fewer new kibbutzim have been established, and they are having difficulty in getting members. They are experienc-

TABLE 2

Investment, Output, Value Added, Exports and Imports, for Agriculture in Israel, 1949–1954, in Terms of 1952 Prices

Item	*1949*	*1950*	*1951*	*1952*	*1953*	*1954*
I. *National totals* (million I£)						
Gross investment[2]	44	57	37	66	53	
Agricultural Gross output[3, 4]	92	120	126	155	168	208
Value added by agric.[4]	48	60	60	90	98	122
Imports of food and food materials[5]	64	68	78	83	84	75
Imports of agricultural production materials[5]	24	19	25	23	21	17
Exports of agricultural products[5]	24	22	23	24	29	42
II. *Per Capita* (I£)						
Gross investment[2]	44	47	26	42	32	
Agricultural gross output[3, 4]	92	98	89	98	102	122
Value added by agriculture[4]	48	49	42	57	59	72
Imports of food and food materials[5]	64	56	55	53	51	44
Imports of agricultural production materials[5]	24	16	18	15	13	10
Exports of agricultural products[5]	24	18	16	15	18	25

Data compiled from various sources, including unpublished estimates.

[1] Preliminary estimate, based for most part on data for first 9 months of year.

[2] Gross investment, not considering depreciation, but possibly not fully complete for private sector of agriculture; includes irrigation and establishment of new agricultural settlements.

[3] Includes value of hay and grain produced on farms and fed to livestock, and of other similar intermediate production goods.

[4] For crop years beginning October 1 of preceding year and ending September 30 of listed year.

[5] Computed on basis of purchasing power parity exchange rates, not formal exchange rates.

ing other difficulties. There is some evidence that the old group cohesiveness has weakened. Spectacular evidence of this is seen in the struggle, sometimes bitter, between rival political factions in settlements which had previously belonged to a single political movement. A split in one of the major political parties, primarily upon issues of foreign policy, was mirrored in a division within some of the larger kibbutzim, leading in many instances to movement of old settlers out of their kibbutz, or to actual physical subdivision of the old settlement. Many observers are now wondering as to the future of these distinctive and once nearly dominant agricultural settlements.[4]

The changes in Israel agriculture since 1948 can perhaps best be summarized by data on gross output, value added, investment, and value of imports and exports. Unfortunately, the available data leave much to be desired. The new state of Israel had many difficult problems to contend with, besides the accumulation of reliable statistics, however useful these might be in planning the economic development of the country. The situation is further complicated by a multiplicity of exchange rates. Food and agricultural production materials were for several years imported at the "A" rate, or I£ 1.0 equals $2.80, and more recently at the "C" rate, or I£ 1.80 equals $1.00. These rates were not realistic measures of relative values, and served to compound the statistical difficulties. Food imports continued in 1953 to be stated in official trade statistics at these rates, even when actual rates applied were different. It is easy to know that the official statistics are highly unrealistic; but it is very difficult to estimate what realistic figures would have been.

The best available estimates are shown in Table 2. Imports of food and food materials and of agricultural production goods and exports of agricultural products are shown in pounds, representing conversion of dollar values into pounds at PPP rates. The latter are an estimate of the actual purchasing power of the Israel pound, and provide what is believed to be a reasonable estimate of the actual Israel pound value of imports in terms of current prices. All figures are shown in constant (1952) prices, and in totals and per capita. Although the data have some deficiencies, and are approximations only, it is believed that

[4] E. J. Mayer, "Collective Land Settlement in Israel," *International Journal of Agrarian Affairs*, vol. 1, no. 5, pp. 29–45 (September 1953).

they correctly represent the major trends and relationships.

Gross investment in agriculture (including irrigation and colonization) has been relatively high, varying mostly between I£ 40 and 60 million annually, or from one-third to one-half the gross agricultural output and from one-half to the full amount of value added by agriculture. An investment rate of this magnitude is of course impossible from agriculture itself, and in fact the funds come largely from abroad, via the government and Zionist organizations.

Agricultural gross output and value added by agriculture, measured in constant prices, more than doubled in 6 years. On a per capita basis, they have increased rather steadily (if 1951, a severe drouth year, be disregarded) and by roughly one-half. Value added is now apparently a somewhat larger percentage of gross output than previously; although the statistics may not be accurate enough to measure this change precisely, it seems reasonable in view of greater production of intermediate agricultural production goods, particularly feedstuffs for livestock.

Imports of food and food materials (such as wheat and oil seeds) increased in absolute terms up to 1953, but declined somewhat in 1954. These data include throughout at commercial prices the value of gift parcels and of U. S. surplus foods bought at relatively low prices. If these had been excluded, the decline in 1954 would have been more marked, because in that year Israel bought a relatively large quantity of U. S. surplus butter. On a per capita basis food imports have declined rather steadily throughout, but at a rate roughly half of that by which value added had increased.

Imports of agricultural production materials have remained almost constant in total, but have declined materially per capita and in relation to gross agricultural output. Not only has Israel agriculture been able to produce more of its own intermediate production goods, but the rest of the Israel economy has been able to produce more fertilizers, insecticides, machinery and parts, and other materials needed by agriculture.

Exports of agricultural commodities (90 per cent or more citrus and its products) remained nearly constant in totals until the 1953–54 citrus crop, by far the largest since the war, added to the value of exports in both 1953 and 1954.

Dr. L. E. Samuel, economic advisor to the Ministry of Agriculture, has made some estimates of Israel's agricultural output, compared to the output from the area now included in Israel during the years prior to the establishment of the state. This has naturally involved some difficult problems of estimation, since the areas of land are different, the price level has changed enormously, and the makeup of the agricultural output has changed also. Excluding citrus, he estimates that the value (in constant prices) of the agricultural output from the area which is now Israel dropped by 40 per cent from 1946–47 to 1948–49, due primarily to the unrest and disturbances accompanying the partition of Palestine and the establishment of the state of Israel. The Arabs took with them their livestock; much of the land they abandoned was not immediately farmed by the Jews; and some of the small terraced fields which the Arabs had farmed by the most primitive implements have gone unfarmed by the Jews. More important, many of the olives which had provided an income for the Arabs have gone unharvested because yields are so low that reasonable wages cannot be earned in picking them. By 1951–52, Dr. Samuel estimates that the total value of agricultural output in Israel (in constant prices) was over 90 per cent of what it had been in 1946–47. The value of livestock production was up about 20 per cent in spite of a much lower output of meat animals, primarily because of the increased poultry production. The value of crops produced, on the other hand, was still 30 per cent below the former level, largely because of the lower output of olives, and partly because many of the very small terraces in the hills on which Arabs had formerly grown grain by use of animal power and hand labor were not suitable for farming with tractors. Total agricultural output rose sharply in 1951–52 compared with 1950–51, because of a bumper grain crop in the Negev, but rose further only moderately in 1952–53 because a poor grain crop in the Negev partially offset increased production due to increased irrigation. Another large increase in total agricultural output occurred in 1953–54 with good yields in all major branches, and the best citrus crop since the war.

General Description of Agriculture in 1954. Present day agriculture in Israel is a result of the many changes made since 1948. The total land area of Israel is about 21 million dunams (or slightly more than 5 million acres). Of this, roughly half is in the southern Negev, and with small exceptions is completely waste from an agricultural viewpoint, not even producing forage for grazing. About 3

million dunams (roughly three-fourths of a million acres) has been classified by the Soil Conservation Service as valuable for grazing; but most of it is now unused for this purpose. Although this land produces good grass, the forage growth all takes place in the winter and early spring, and from mid-May until late November or later the grass is dry and increasingly unpalatable. Plans are under way to build a livestock economy based upon these natural range lands and upon irrigated pastures and crop residues, but in 1954 this was still largely in the future. Nearly one million dunams (250,000 acres) has been classified by the Soil Conservation Service as chiefly valuable for forestry. Other groups consider a larger area as chiefly valuable for forests. Over the past 30 years or more, considerable reforestation has been carried out, some quite successfully, and large parts of this land are now growing trees. However, relatively little has been harvested, and large areas best suited for tree growth are still unplanted.

With the exception of urban areas, most of the remainder is potential or actual crop land. The Soil Conservation Service classifies as suitable for crops, without irrigation, 4.6 million dunams and with irrigation 5.5 million dunams. The larger area suitable for irrigation is due to the fact that there are moderately large areas of good soils where the rainfall is too low to produce even a crop of dryland grain. These are gross areas; when roads, ditches, farmsteads, and other areas have been deducted, the net crop area is perhaps 20 per cent smaller. The area actually cropped has varied from about 3.5 to 4.0 million dunams (slightly less than 1 million acres) annually; it varies largely depending upon rainfall, expanding in a relatively wet year and contracting in a dry one. Of this total, roughly 600,000 dunams were irrigated in 1953, and about 800,000 dunams in 1954. Of the irrigated area, a large part—250,000 dunams or more—is citrus groves, deciduous orchard, and vineyard. Of the remaining irrigated land, perhaps 50 to 60 per cent is used for vegetable and potato production, and perhaps one-third for production of green fodder, pasture, and alfalfa mostly fed green, and similar crops, which provide the green feed basis for the dairy enterprise. A considerable part of the irrigated land is double cropped; the area of crops harvested may run as high as 1.4 times the physical area irrigated.

The area of annual crops grown without irrigation and of fallow combined is roughly three million dunams, depending largely upon the rainfall and the prospects for successful grain growing in the drier areas. In this Mediterranean climate all the rain comes in the winter. Grain can be grown in winter where the rainfall is from 10 to 13 inches or more, and in many areas the soil stores enough moisture to permit a summer crop of corn or sorghum. Hay, particularly various kinds of clover, is grown in the winter with a single cutting in the spring; this, and fodder and other dairy feeds, has taken from 400,000 to 500,000 dunams of unirrigated cropland annually. Many other unirrigated crops are grown, although no one crop occupies a large area—unirrigated orchards and vineyards, especially olives, melons, tobacco, and others.

The number of agricultural settlements has been shown in Table 1. In these settlements it is estimated that there are 42,400 Jewish, 14,500 Arab, and 3,100 Bedouin "farm units." In the moshavim, a farm unit is a farm and the farm family, but in kibbutzim the meaning of a unit is not always clear—sometimes families, sometimes adults.

The older settlements, both moshavim and kibbutzim, are moderately well developed agriculturally. That is, given their present supply of irrigation water and their present areas of land, they are producing crops rather fully. A substantial part of their total croppable area is capable of irrigation development, when water is available. It is often contended that the kibbutzim could produce more crops from their present land and water if they could get more labor. These settlements mostly follow the intensive mixed farm pattern, with dairy and poultry, vegetables, and limited areas of crops. There is some variation from region to region, and some difference in emphasis on various enterprises from one settlement to another.

The newer settlements are much less fully developed. Of the newer moshavim, 5 per cent still lack any irrigation water, and 20 per cent have irrigation installations for 5 dunams or less, and only 29 per cent have installations for more than 10 dunams. When it is remembered that a dunam is but one-fourth acre and that without irrigation crop production is severely limited, it is evident that this is a low degree of development of what is in any case a small farm. Moreover, the area actually irrigated is, for one reason or another, less than the area for which irrigation installations have been completed. Many of the newer

moshav farmers have been growing mostly vegetables on a small irrigated plot, of perhaps 4 or 5 dunams, divided up into perhaps as many as 10 different fields or crops, and with at the best one dairy cow and not more than 50 hens. The newer kibbutzim are particularly short of members, partly because they cannot offer as good housing and other material comforts as the older kibbutzim. They are often using most of their cropland, as yet unirrigated, to produce grain for their poultry and dairy enterprises, usually the best developed enterprises. They have, in general, not grown many vegetables, mostly for lack of labor.

Production of vegetables and potatoes has increased greatly in Israel in the past five years. Per capita supply of fresh vegetables in Israel is approximately the same as in the United States; far fewer vegetables are processed. The large per capita supply in Israel is the more remarkable because there are fewer kinds of common vegetables and a poorer seasonal distribution of supply than in the United States. The per capita consumption of fresh tomatoes is twice that of the United States; cabbage, carrots, and cucumbers are each basic vegetables, consumed in larger volume per capita than in the United States. The same is true of cauliflower, eggplant, and peppers. But lettuce, celery, and sweet corn are much less important, and the "specialty" vegetables of the United States are relatively uncommon in Israel. Potato consumption per capita is only about half of that in the United States. Vegetables are in ample supply through the summer months, with surpluses sometimes occurring, and in less generous supply at other seasons. Vegetables are produced in Israel largely by hand methods, often from very small fields. Until recently almost no attention was paid to quality. In the earlier years, there was a scarcity and almost anything could be sold. In the past two seasons, there has been a minimum price fund operating, which has sometimes taken surpluses off the market. With relatively ample supplies now, more attention will be paid to quality. Vegetable production has been the mainstay of the newer settlements; with their limited areas irrigated, often vegetables were the only crop that could provide productive employment for the farmer. Thus the new settlers were generally taught first how to grow vegetables.

The situation with respect to fruit is in many ways similar to that of vegetables. Per capita consumption of citrus, including juices, is as high, or higher, in Israel as in the United States in spite of a much shorter season for fresh fruit. Grapes and melons are the other two staple fruits, consumed in as large, or larger, volume per capita as in the United States. Temperature zone fruits such as apples, pears, and peaches are consumed in Israel, from domestic production, but to a much smaller extent than in the United States. Excellent bananas are grown and eaten in considerable amounts. There is on the whole much less variety of fruits in Israel and a much less uniform seasonal supply than in the United States—there are serious disadvantages to a small self-contained agricultural economy. Before the war, domestic consumption of citrus was about ten per cent of total production, and the rest was exported; now, roughly one-fourth is used within the country. One of the staple crops of the Arabs was olives, which were eaten by the grower and sold as olives or for oil. Large areas of the hill country, as well as extensive areas of the plains, were in olives when the new state was established. The yield per dunam of these olives, only rarely irrigated, is low and the olives are very small. In many cases, farmers today cannot earn as much picking olives as they can on public works; olives will not even pay the cost of picking. Efforts have been made to increase yield or at least to increase olive size and so reduce the picking costs. Large scale plantings of fruit, especially grapes, apples, and plums have been made in the past five years. A serious surplus of wine grapes has already appeared, and large supplies of all fruits may lead to ruinously low prices when the recently planted trees come into full bearing.

Dairying is in many ways the core of Israel farming. It provides a means of converting forage into cash; it affords productive employment for a relatively large amount of labor, and the manure is important in providing much needed fertilizer. Almost every settlement has some dairying; even kibbutzim established in frontier locations have dairies, to which they haul the hay and other feed from relatively distant areas. At the same time, the milk produced is relatively high cost milk. In the past five years, nearly all of it has been used for drinking; and in addition, imported skim milk powder and water have been added to the whole milk to stretch it further and to lower its cost. The price of whole milk to the farmer in Israel is nearly as high as the cost to the consumer, since the government subsidizes almost the whole cost of marketing. Other dairy products are imported, or

made from imported skim milk powder. Israel has been fortunate in getting skim milk powder and other dairy products from the United States at surplus sales prices, although such low cost supplies are a barrier to expansion of domestic production. Many agricultural leaders in Israel feel that dairying must expand as the new farms develop—some go so far as to say that successful farming without dairying is impossible. Yet it appears most unlikely that farmers will be willing to produce milk at the lower price at which a larger volume would have to sell.

Poultry, to produce both eggs and meat, is one of the anomalous branches of agriculture in Israel. Egg consumption per capita is very high, almost as high as in the United States, and far above that usually found in countries of the same per capita income as Israel. Eggs have been rationed, but there is an extensive black market, with perhaps one-third of the eggs sold through it. Poultry production is predominantly by white Leghorns, kept in large flocks of several thousand in the kibbutzim and in smaller flocks, but sometimes of several hundred, in the moshavim. Production methods are commercialized and well advanced technically. A substantial part of the grain and protein feed required is imported, and costs are high in foreign currency. Relatively large numbers of chickens are raised for meat; poultry has been rationed but was recently taken off ration because nearly all of it was going through black market channels. In poultry particularly, and to some extent in dairying, Israel has a type of agriculture producing a relatively costly product.

Part of the explanation of the poultry branch is to be found in the very low production of meat. Very few cattle, sheep, or goats are kept for meat now. There is some meat production as a by-product of the cows kept for dairying and of the milking sheep, but this and the meat produced from meat animals adds to possibly five to ten pounds per capita annually. Meat has been rationed, but at about one-fourth pound per person per month. There has been an extensive black market in meat. With so little meat, Israel consumers have naturally been anxious to obtain eggs and chicken, and perhaps this has affected the demand for milk also.

Cereals form the backbone of the Israel diet, providing about half of the total calories consumed in Israel. Most of the wheat for human consumption is imported, while the little domestically grown wheat is fed on the farm where raised. The principal grain raised is barley, which is fed to the dairy cows and chickens. Grain production is not profitable in itself, but it makes possible the keeping of cows and chickens, which is profitable even at official prices and extremely so at black market prices. There seems to be considerable possibility in growing corn on a larger scale, both with and without irrigation.

One distinctive branch of agriculture is the raising of fish in ponds. Although water is scarce and expensive in most of Israel, there are some localities—in the Huleh, in the Beisan Valley, and near Hadera—where water is ample and cheap. Ponds several acres in size and a few feet deep are constructed, and water flows or is pumped through them. Carp are raised, to a size of roughly one pound. Grain and other feedstuffs, and fertilizer, are added to the water, for direct consumption by the fish and for various forms of water life which can in turn be eaten by the fish. Such production is possible from waters too saline for crops, although the fish do better in fresher water. Roughly 10,000 acres are now in fish ponds, and the production of fish is roughly one ton per acre. The carp raised in this way are shipped to the retail market alive, and are highly prized by most Israeli consumers. They are relatively expensive. Fish ponds have been frequently criticized because they use so much water and so much feedstuff, much of which is imported.

Israel uses predominantly American makes of farm machinery—Farmall, Case, Oliver, Allis Chalmers, Caterpillar, and other such names are as familiar to Israel as to American farmers. Israel agriculture is rather heavily mechanized, perhaps too much so. Farm machinery is expensive because of the cost of transportation which affects not only the new machines but also their servicing. Animal sources of power are unfortunately expensive also. At present only a few draft animals are raised locally and mules have been imported, often at a cost of $500 each. For plowing and the heavier tillage operations, tractors are unquestionably more efficient. In many branches, there is much hand labor. One gets the impression that in many instances there are few methods intermediate between hand methods and the most highly mechanized methods.

Considering the amount and kinds of machinery used, agricultural production in Israel must be considered inefficient. Labor input per unit of area or of product is often three to five times as much as on the same crop in the United States. This is true

even for comparable degrees of mechanization. We have estimated that the production which is planned for 1960 will require 24 million mandays of labor at current Israel performance rates, but only 10 million mandays at present American performance rates. The large number of inexperienced farmers is one obvious explanation of these high labor inputs. The very small fields undoubtedly add to the time required to do a job, as well as to the time spent in traveling from the central tractor stations to the fields. Some Israel agricultural specialists believe that the soils of Israel require more power to accomplish the same operation, but this seems doubtful. Perhaps the most important single factor is the fact that efficiency in operations has never been stressed in the thinking of farmers, and that there simply is not the same attitude toward costs and efficiency in Israel that there is in the United States.

In general, Israel agriculture is carried on on a fairly high plane of technical knowledge and competence. Fertilizers and insecticides, both of which require technical knowledge, must be used heavily. Fairly advanced techniques are employed in livestock management. Artificial insemination is common for dairy cows. The rate of feeding of cows is moderately high—5000 to 6000 pounds TDN per cow; with fairly high milk production, 7500 to 8000 pounds. The dairy cows are predominantly Holsteins of fairly high breeding. The rate of grain feeding averages perhaps one and a half tons per cow. One serious obstacle to cheaper dairying is the absence of a really good roughage. In the summer, irrigated pastures, alfalfa cut and fed green, corn cut and fed green, and various varieties of beets, form the main roughages. The chief hay is vetch mixtures, grown in the winter and cut in the spring, and not fed until the following winter. Such hay is often of low quality. Irrigated alfalfa for hay offers great promise, but the high cost of irrigation water is a serious factor. The need to get the greatest possible output from the limited area of cropland per farm also influences the types of roughages grown.

Irrigation is now important in Israel and will become more important in the near future. Unfortunately water costs will be extremely high under the programs now under way and those planned for the future. Roughly 300,000 dunams have been irrigated for some years by relatively small private works, chiefly wells pumping directly onto the adjacent land, although some water has been pumped from streams and some obtained by simple diversions from streams or springs. Much of this irrigation is for citrus, and there has been no subsidy for this type of irrigation. A comparable area is irrigated by the central water supplier, Mekorot Water Company, a semi-governmental organization, primarily by works erected during the past six years. This company has been chosen to construct and operate the new irrigation works. Its costs are very much higher than for the older developments, partly because the water resources it is developing probably could not be developed as cheaply as those already developed by private capital, but perhaps partly because of its disregard of costs as a major consideration in irrigation development. When the regional projects of Mekorot are completed, the estimated annual cost of irrigation water per acre to be provided by the Mekorot Water Company will be $100 and possibly higher. In the United States, even the intensive citrus and vegetable growing areas of southern California, southern Arizona, and southern Texas have considered that about $30 per acre annually was the limit of costs that could be borne. Costs in Israel are high for a number of reasons: the areas planned for irrigation lie at long distances from and at much higher elevations than the sources of the water; energy costs for pumping are higher than in the United States; costly methods of construction and of operation of the irrigation systems have been employed; and costs of irrigation on the farm are unusually high because of the almost universal use of sprinklers, which require much energy for operation as well as having high depreciation costs. Means have been suggested for cutting these high costs by 40 per cent: irrigation of equally good land nearer sources of water; cheaper sources of power; less costly methods of construction and operation; and use of gravity systems of irrigation on the land wherever possible. Even at the best, irrigation water in Israel is going to be very costly. Water costs which might be borne to produce citrus and vegetables, where cost of water is only a small part of total production costs, may become impossible in production of crops such as cotton, sugar beets, peanuts, and alfalfa. Irrigation was provided some of the frontier settlements, partly for security reasons, at costs which simply cannot be borne by the farmers in these areas. Large scale subsidization of irrigation costs may unfortunately become necessary.

Agriculture in Israel has a number of excellent agencies to provide it with technical information

and to assist in its development. There is an Agricultural Experiment Station, very similar in organization, staffing, and functioning to agricultural experiment stations in the United States. There is a Ministry of Agriculture, with specialists organized into different departments. It not only provides technical information, but also helps to develop plans and provides credit. Until recently its operations were highly centralized, with specialists working out from a central office. Now it also has regional development officers, who develop programs and help to extend credit within their particular regions. Responsibility for the new settlements rests with the Colonization Department of the Jewish Agency, which has central office, regional, and village specialists and instructors to provide technical help, extend credit, and actually carry out programs to establish new settlements. When a settlement reaches a mature stage where its problems are those facing any older settlement, the Ministry of Agriculture takes over.

Problems for the Future. This discussion of the present state of agriculture in Israel has outlined at least some of the present problems. An attempt to enumerate future problems may, of course, turn out to have missed some of the more difficult but unexpected problems. But a brief listing of some of the major problems facing Israel agriculture for the next five to seven years may be useful.

The most important and the most difficult problem facing agriculture extends much beyond agriculture—the problem of security and of peace. Few Americans can realize the obstacles under which agriculture is carried on in Israel today. In nearly every settlement an armed guard is posted every night. A man works all day on his farm, and then several nights a month stands guard half the night. Such guard is not a matter of form: infiltrations, thefts, and assaults by individuals or groups from across the border are all too common. Livestock is stolen frequently, and such thefts constitute a major obstacle to the development of a sound livestock industry. Movable aluminum irrigation pipes can never be safely left in the field at night. Farm tools and machines must always be brought to the village or the home each night. Other aspects of the security problem are even more serious. Along the frontier, men and women in the fields may be fired upon at any time. Within settlements, a house may be bombed or fired upon at night. Far more serious than the physical losses and actual danger is the constant watchfulness necessary, a watchfulness that places many people under a constant tension. The modern Israel farmer and the pioneer American farmer in hostile Indian territory would understand each others problems. Unless genuine peace can be attained, and with it a degree of security of person and property hitherto unknown in Israel, agriculture will continue under difficulty, and many achievements that would otherwise be possible simply cannot be gained.

The history of agriculture in the past six years has left a legacy of problems. The settlement process created many new kibbutzim, which have their manpower problems, and still larger numbers of new moshavim. Farms in the latter are only 28 dunams in size, and few are fully developed. Farm units were established in imitation of the older farms that had grown up under a very different economic and social environment. Many settlers are still unskilled in farming and are reluctant entrepreneurs. It is possible that a different settlement process would have been better; immigrants could have been put into much larger temporary villages, crops grown by hired labor on government or on cooperatively managed farms, and new permanent settlements of independent farm units established only as farmers developed the capacity and the initiative for them, and farm units established in sizes and types suited to the new market opportunities. As it is, the small farm is severely handicapped. Irrigated corn, cotton, sugar beets, peanuts, and similar field crops cannot be grown on such farms except at very high costs, yet production of these crops must be expanded.

Next in importance to the problems raised by security needs is the broad problem of costs and efficiency in Israel agriculture. During the past few years the most pressing problems were to occupy the newly-won land, to settle the new immigrant, and to produce almost anything because the people needed it and because the new farmer had to be taught to produce. But that stage has passed. Agriculture is inefficient; it must somehow learn to reduce inputs, especially of labor, while at the same time increase output. This involves labor efficiency studies and educational programs. Farm machinery must be used to better advantage. Irrigation water must somehow be obtained cheaper—not merely by subsidizing the projects but cheaper in a real sense. All of this is

going to be difficult, and not as dramatic as the establishment of new settlements and the winning of the land, but in the long run as essential for the economy and economic independence of Israel. The state has a serious adverse trade balance and is dependent upon import of capital even for consumption. Agriculture alone cannot correct this situation, but must be prepared to do its share.

The settlement process must be brought to completion, partly because most of the new settlers are not yet capable of standing on their own feet economically, but partly also to make agriculture more efficient. Most of the new settlements—roughly half of them—are still far from being fully developed. Planned on a minimum area for highly intensive farming, there is serious doubt if they can be economic without larger areas per farm. This is especially true for the crops which most need to be expanded. A considerable part of the investment has been made to provide the settler a house and for other purposes, yet the farms are less than half as productive as they should be at full development. More irrigation water must be made available, also somewhat more working capital, and the output gradually expanded. Work is actively under way along these lines, and it is only a question of how rapidly, and how far, these developments can be pushed. There is also fairly general agreement that no new settlements, or at any rate very few new ones, should be established until those established since 1948 are brought to reasonably full development. All major parts of the country have been settled, at least to some extent, and immigration has fallen nearly to zero; this seems a time to consolidate gains already made, rather than to try to push further into new territory.

One aspect of agricultural development will be to find more and better export products. The dominant export is, and always has been, citrus. The question is, how far and how rapidly can its exports be increased? Substantial areas of citrus have been planted in recent years, and plans call for further plantings in the next few years. Such plantings will partly replace the loss of groves which occurred during the war and by encroachment of urban areas upon citrus groves. The total area to be planted will be less than that used before the war. It will obviously be some years before the new groves will be in heavy production. When production increases, the problem of markets and prices may become serious. There are some possibilities of other exports: canned vegetables, peanuts, flowers, and fruits, especially bananas. It is not generally realized in Israel the extent to which costs of production and quality of product will determine export possibilities; the physical possibilities are present in many instances if the venture can be made practical economically.

Closely related to the development of exports is the reduction of imported agricultural commodities and production materials. Much attention has been given this matter and many plans are afoot. The biggest problem of all is grain of all kinds, and grain substitutes, for human and animal consumption both. The big import is wheat. Israel is not a good wheat growing country, and an effort to grow all the wheat needed would result in very costly wheat indeed. But wheat production can be increased somewhat and wheat substitutes can be increased greatly. Most important among the latter are potatoes, both white and sweet, and corn. Sweet potatoes and corn are now used for human consumption only to a limited degree, and per capita consumption of white potatoes is only half that of the United States. There would be important problems of dietary preferences to overcome, but to no small extent the problem here is also one of costs and of quality. At present, imported wheat is a much cheaper source of calories than any of these other sources. Grain and similar feeds are imported for dairy cattle and for poultry. These imports may be reduced by reduction in the size of the poultry enterprise, by greater production of grain domestically, and by production of better roughages for dairy cattle which will reduce grain feeding rates. Domestic industries to produce fertilizer and insecticides exist and are expanding. If draft animals could be raised locally, that would reduce the cost of their import.

The marketing of agricultural commodities will also become more important in the next few years. As scarcity gives way to plenty, or even surplus, the marketing problem will grow more serious. Grading of products, with a price differential according to quality, appears imminent for vegetables and probable before long for other products. One major policy issue will be the degree to which the market will become completely free of control and the extent to which either production, marketing, or price controls will exist.

In conclusion, one must repeat what was said at the beginning: agriculture in Israel has made truly great progress in the years since the state was established, but it still faces many difficult prob-

lems. The same courage, vision, and knowledge which has brought it this far should be able to deal with the remaining problems, different and difficult though they are. And we may expect that, as the present problems are solved, new ones will arise or become evident.

THE BOARD OF EQUITABLE ADJUDICATION, 1846–1930

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Although there has been marked improvement during recent years in the attention that is being given by historians to questions concerning the public lands, it will be conceded by some that the administrative practices, regulations, and decisions of the General Land Office have been passed over too lightly. The agency that is the subject of the present study has not received mention, much less adequate treatment, in any published historical work. It is not considered in any of the general histories of the public lands.[1] Donaldson did not find room for it in his ponderous volume.[2] Monographic studies do not deal with it.[3] Even the annual reports of the Commissioner of the General Land Office contain very little information concerning it. Some will hasten to conclude that such obscurity must be deserved. The present writer does not believe that it is. Mere longevity of an institution does not in itself justify historical study, yet the fact that the active life of an administrative agency spans the years from James K. Polk to Harry S. Truman suggests that it merits attention.[4]

During its lifetime the Board of Equitable Adjudication functioned in connection with every major land law. The powers and prerogatives of the General Land Office were extended by it. In 1890 it was asserted that the legality of the titles to thousands of entries depended upon its rulings.[5] Following the enactment of the Three-Year Homestead act in 1912 which provided, among other things, for the reduction of the statutory life of an entry from seven to five years the Board was threatened with an inundation of appeals. It was asserted that the greater part of the 300,000 homestead entries then outstanding would have to pass through its hands for confirmation.[6] Fortunately it was possible to reconcile the new requirements with established procedures in such a way as to protect existing entries without Board action. If this had not been done the historians of the public lands, whose principal index of importance is the number of acres involved, would have had a first rate problem on their hands. Earlier in the career of the Board a section of the general land act of 1891 providing for the automatic confirmation of certain classes of suspended entries that had been regularly processed by it, reduced its jurisdiction at a time when its work for

[1] Benjamin H. Hibbard, *A History of Public Land Policies* (New York, 1924); Roy M. Robbins, *Our Landed Heritage* (Princeton, 1942).

[2] Thomas Donaldson, *The Public Domain, its History with Statistics* (Washington, 1884).

[3] Harold H. Dunham, *Government Handout, A Study in the Administration of the Public Lands, 1875–1891* (Ann Arbor, 1941); Paul Wallace Gates, *Fifty Million Acres: Conflicts over Kansas Land Policy, 1854–1890* (Ithaca, 1954); Charles Lowell Green, *The Administration of the Public Domain in South Dakota* (Pierre, S. D., 1939); Addison E. Sheldon, *Land Systems and Land Policies in Nebraska* (*Publications of the Nebraska State Historical Society*, vol. 22, Lincoln, 1936).

[4] The most recent decision that has come to the attention of the present writer was written by Oscar L. Chapman, Under Secretary of the Interior, April 4, 1947, *re* Carl F. Reynolds, *Decisions of the Department of the Interior Relating to the Public Lands*, 59: 486 (Hereafter cited as L.D.).

[5] Secretary William F. Vilas to Commissioner Strother M. Stockslager in the Irwin Eveleth case, January 21, 1889, *ibid.*, 8: 88–93, especially page 91. This letter contains an exhaustive review of the legal aspects of the Board's jurisdiction. This case and *Pecard v. Camens*, *ibid.*, 4: 152, involve the highly complex problem of lands offered for public sale being withdrawn because they were located within the bounds of a grant, then offered at the double minimum price and entries permitted by local officials without the formality of reoffering after the price was reduced. Strictly speaking, these cash entries on unoffered public lands were void.

[6] Instructions prepared by First Assistant Secretary of the Interior, Andreus A. Jones, to General Land Office, December 23, 1913, *ibid.*, 42: 579–580.

a single year had amounted to action on 8,841 entries involving a total of nearly a million and a half acres.[7]

The justification for a careful study of the Board of Equitable Adjudication does not rest entirely on the fact that it confirmed the titles to a significant number of entries every year. It lies partly in providing one feasible line of approach to the study of the larger problem of land administration in Washington as well as in the local offices. In Board cases the primary concern of the officials seems to have been with the *bona fide* settler who was trying to comply with the law. However much the broad canvas that is the picture of land administration may be painted in the dark colors of fraud, corruption, and unscrupulous self-seeking, here is a small segment that stands out in bold relief: an agency of public land administration whose only purpose was to confirm the title to a particular tract of land to a person who had tried to comply with the law, but had failed in some particular through ignorance, error, or obstacle over which he had no control. Even granted that on some occasions title was confirmed to an entryman whose honest purpose might have been questioned, this type of perspective on the operation of governmental administrative machinery provides a healthful corrective.

Another aspect of the study of the cases that came before the Board has even greater possibilities. They provide the "control" data that are essential to a detailed study of land entries, particularly those entries that became involved in contest cases. In the administrative mind there was a great gulf fixed between a "Board" case and a contest case. An essential ingredient of the former was that the only parties in interest were the government and an entryman who did not have a legal leg to stand on. Indeed in most instances his entry was vulnerable to contest prior to its suspension. If perchance a valid contest were filed it could not be a "Board" case, but followed the regular channels for handling contests. If contesting was as well-nigh universal as it appears to have been in the early phases of settlement; and if every new community was burdened with an over-supply of professional contestors who blackmailed entrymen into buying them off, land locators who searched out the entries liable to contest, land lawyers who specialized in contest cases, loan-sharks who traded in contested entries and relinquishments, and just ordinary shysters who sought to harvest the fruits of the labors of other men—if all these were present in a new community, why were there any Board cases at all? When the present writer first became interested in the Board of Equitable Adjudication more than fifteen years ago, it was with the purpose of seeking an answer to this question. Although this broader objective has not been attained, it is possible at this time to present a reasonably complete history of the agency.

The establishment of the Board of Equitable Adjudication may be traced to the following passage contained in the report of the Commissioner of the General Land Office for 1845,

> Cases of suspension (of land entries) for various causes exist in all the States and Territories in which the public lands are situated. These have been accumulating since the commencement of the present public land system, and give rise at the present time to an amount of correspondence very embarrassing to the operations of this office. In many instances patents are withheld from claimants for causes wholly irremovable under existing legislation; and yet, on principles of substantial justice, the purchasers are entitled to their patents. As it is utterly impracticable to provide by law for each particular case, and as it is necessary that these suspensions, which are increasing from year to year, be finally disposed of, I would suggest that the Secretary of the Treasury, the Attorney-General, and the Commissioner of the General Land Office be authorized by law to act together as a board, and examine and determine all cases of suspension upon principles of equity and justice. In this way, honest and *bona fide* purchasers will be able to obtain their patents, and claims that are unjust and inequitable can be finally rejected. Some measure of this kind is indispensable to relieve this office from embarrassment and remove the doubt and uncertainty which hang over the titles of some of our citizens to the very farms on which they have resided for years.[8]

[7] *U.S. Statutes at Large*, 26: 1095–1097, as interpreted in Instructions dated July 1, 1891, L.D., 13: 1–3, and April 29, 1930, *ibid.*, 53: 101. A law passed on March 2, 1889, *U. S. Statutes at Large*, 25: 896, provided for the automatic confirmation of a type of suspended entry that had been referred to the Board in large numbers.

[8] *Annual Report of the Commissioner of the General Land Office for 1845* (29 Cong., 1 Sess., Executive Document no. 12), 6. Hereafter cited as L.O.R. James Shields as Commissioner addressed his report to R. J. Walker, Secretary of the Treasury. The purpose of Congress in creating the Board was well stated by Secretary Lucius Q. C. Lamar to Commissioner William A. J. Sparks in *Pecard v. Camens*, September 17, 1885. After reviewing the several laws the Secretary said, "The necessity for this law was occasioned by the fact that through inadvertence or ignorance it was found

On August 3, 1846, the law establishing the Board of Equitable Adjudication, fixing its jurisdiction, and requiring it to report to Congress was enacted.[9]

The meager bits of information that are available indicate that the Board functioned as planned and the accumulated suspensions were confirmed or cancelled. The act of August 3, 1846, which expired by limitation in two years, was renewed on July 17, 1848. By December of the following year under its new lease on life the Board had processed 3,495 cases.[10] As a result of persistent pressure by the General Land Office legislation reviving the Board for a period of ten years and authorizing it to deal with both accumulated and current cases was enacted on March 3, 1853.[11] With the exception of an important modification of the jurisdiction of the Board made in June, 1856, and a few scattered decisions published in Lester's *Land Cases*, there is a gap of nearly fifteen years in its history.[12] In 1871 the Commissioner of the General Land Office reported that he had submitted a number of cases "to the board constituted under the act of August 3, 1846, as amended . . . to confirm certain equitable cases. . . ."[13] Two years later the provisions of the several acts plus an additional section extending jurisdiction over all cases that had arisen since June 26, 1856, and all that might arise under the several land laws in the future appeared as sections 2450 through 2457 of the *Revised Statutes of the United States*.[14] A curious feature of these sections was the perpetuation of the Secretary of the Treasury as a member of the Board in spite of the legislation of August 3, 1849, which had transferred all duties relating to the General Land Office from the Treasury to the Interior Department. On February 27, 1877, this error was corrected.[15] The last modification in the membership of the Board occurred in 1922 when the Attorney-General was dropped.[16] It appears that the agency had some sort of special staff. At least one of the printed lists of suspended entries confirmed by the Board bears the names of two clerks who processed these cases. On the envelopes which contain the materials relating to the cases there appears a stamp confirming the action of the Board of Equitable Adjudication which bears the name of C. A. Lawrence, who is designated as the Secretary of the Board.[17]

Just as the general land administration was operated on the basis of the "Rules of Practice" so the Board of Equitable Adjudication functioned within the framework of a set of rules. These were prepared by the Commissioner of the General Land Office and approved by the other members. Every case that was submitted to the Board had to be placed under a rule or designated as a "Special" case. Although the Land Office attached a great deal of importance to the principle of *stare decisis* the practice of submitting new cases by citing decisions in earlier ones of a similar character was specifically prohibited.[18] The procedure seemed to be that each separate case had to stand on its individual merits within the framework of a general rule.

Prior to 1922 the Board had adopted thirty-four rules for the guidance of the Commissioner of the General Land Office in submitting cases. A complete set of these rules has not come to the attention of the present writer.[19] In spite of the cheerful comment made by Secretary George Chandler

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that many instances occurred in which, without any fault of the purchaser, in the administration of the land laws, some essential step demanded by law or departmental regulation had not been observed, and Congress was frequently called upon by special acts to supply the broken threads in the title. To this Board was committed the supplying of these broken threads, whenever the purchaser on his part had conformed to law and the neglect or breach had been on the part of the officers of the government." L.D., 4: 156.

[9] *U. S. Statutes at Large*, 9: 51; L.O.R., 1846, p. 5.

[10] L.O.R., 1849, p. 30.

[11] L.O.R., 1850, p. 17; 1852, p. 68, and 1855, p. 156.

[12] W. W. Lester, *Public Land Cases and Land Laws* (Philadelphia, 1860), 484–490.

[13] L.O.R., 1871, pp. 31–32.

[14] 1873–1874 edition, 1: 452.

[15] L.O.R., 1875, p. 20; 1876, p. 10.

[16] C. G. Fisher, comp., *Circulars and Regulations of the General Land Office* (Washington, 1930), 311.

[17] All of this material is in the National Archives. Particular cases may be found by ascertaining from the Tract Books (also in the Archives) the final certificate number assigned to a given entry by the local land office.

[18] Acting Secretary George Chandler to Commissioner Lewis A. Groff, March 13, 1890, L.D., 10: 299; Secretary Noble to Attorney-General W. H. H. Miller, March 6, 1890, *ibid.*, 10: 299–300.

[19] Rules 1–16, adopted October 3, 1846, March 13, 1847, and March 16, 1854, are contained in Lester, *Public Land Cases and Land Laws*, 482; Rules 17–27, approved May 8, 1877, are in L.O.R., 1877, pp. 100–101; Rules 28, 29, 30, adopted April 28, 1888, may be found in L.D., 6: 799–800; Rules 31, 32, and 33, adopted April 28, 1890, may be found *ibid.*, 10: 502–503.

that the rules were "simple and relatively few in number" a mere reading of them would consume a substantial amount of time. Perhaps their flavor can best be conveyed by quoting the general statement that was promulgated in 1922 when all of the previous rules were revoked. On that occasion the jurisdiction of the Board was defined to include,

> All classes of entries in connection with which the law has been substantially complied with and legal notice given, but the necessary citizenship status not acquired, sufficient proof not submitted, or full compliance with the law not effected within the period authorized by law, or where the final proof, testimony, or affidavits of the entrymen or claimants were executed before an officer duly authorized to administer oaths but outside the county or land district in which the land is situated, and special cases deemed proper by the Commissioner of the General Land Office for submission to the Board, where the error or informality is satisfactorily explained as being the result of ignorance, mistake, or some obstacle over which the party had no control, or any other sufficient reason not indicating bad faith, there being no lawful adverse claim.[20]

From one point of view the thirty-four rules taken as a whole give an insight into the mechanics of an administrative agency which had become bogged down in minutia and detail of its own creation. The regulations for final proof required six publications of the official notice, but many proofs were accepted by the local officials wherein it was clear that only five publications had occurred. The regulations designated certain officials as proper ones to take proof, but entrymen frequently made their proof before other kinds of officials. The printed notices would specify that the final proof would be made by a given entryman on a particular date at a specified place, but frequently the proof was made and accepted a day or two early or late,[21] or at a different place,[22] perhaps in a different town. More serious was the failure to begin residence on the land within six months after entering it or to prove up during the statutory lifetime of the entry.[23] A blizzard, a washout on the railroad, illness in the family, or any one of the many vicissitudes of life could cause a delay that would render the final proof of an entryman liable to suspension.

In addition to providing the means of curing reasonably trivial defects in the final proof process, the body of rules adopted by the Board established definite procedures for regularizing exceptions to the regulations which formed the basis of administering the public land laws. It is in this connection that an analysis of the jurisdiction of the Board as revealed in the published decisions and statements of its members will be of some value. Beyond doubt the most definite statement concerning the powers of the Board of Equitable Adjudication is contained in a letter from Secretary of the Interior Henry Teller to Commissioner of the General Land Office N. C. McFarland on December 8, 1882. In part the Secretary said,

> This Board is a tribunal of special and limited jurisdiction. Its powers are conferred and defined by statute. Outside of these it has no authority, but within the sphere thereof they are exclusive, and no other person, officer, or tribunal may control its doings .... Hence no appeal lies from the decisions of this Board, nor are they subject to review in any other tribunal, because the statute is silent in respect to these matters. When, therefore, a case is referred to the Board, it becomes invested with its statutory rights, it acquires exclusive jurisdiction thereof, and your office and this Department lose all control over it.[24]

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[20] Fisher, *Circulars and Regulations of General Land Office*, 311.

[21] The most complete account of the problem of proof that was not made on the day advertised is contained in a discussion of the Martin Gleeson case by Secretary Chandler in a letter to Acting Commissioner William H. Stone, August 16, 1889, L.D., 9: 283–284. The effect of the law of March 2, 1889, upon the jurisdiction of the Board is discussed. The 7th section provided for automatic confirmation if proof was made within ten days of date advertised provided the delay was due to "accidents or unavoidable delays." See application of this new procedure in a Dakota case, May 23, 1890, L.D., 10: 596–597. The leading case on this point is the Geraghty case, Acting Secretary Henry L. Muldrow to Acting Commissioner Stockslager, January 16, 1888, *ibid.*, 6: 460–461. See circular, July 17, 1889, *ibid.*, 9: 123–124. A case of early proof is described *ibid.*, 6: 695.

[22] Secretary Chandler to Commissioner Thomas H. Carter of General Land Office, January 29, 1891, *ibid.*, 12: 102–103.

[23] The cases of dereliction in these respects are too numerous and the materials too voluminous for specific citation. A large proportion of the cases listed in the abstracts of suspended entries involve one or the other of these *laches*. The leading case so far as the failure to reside in six months is concerned is the Frank W. Hewit case first reported *ibid.*, 7: 488–490 and again on review *ibid.*, 8: 566–570.

[24] *Conlin v. Yarwood*, *ibid.*, 1: 411–413. The exclusive

The "special and limited jurisdiction" to which Secretary Teller referred included "all suspended entries and locations" arising under any of the land laws wherein,

> . . . the law has been substantially complied with, and the error or informality arose from ignorance, accident, or mistake which is satisfactorily explained; and where the rights of no other claimant or pre-emptor are prejudiced, or where there is no adverse claim.[25]

In another portion of the statutory basis of the Board it is explicitly stated that it could operate only "to divest the title of the United States" to the entries referred to it for confirmation. As has been pointed out earlier the absolute condition for consideration by the Board was the absence of an adverse claim to the land.[26] If, as happened in many instances, a contest had been brought against an entry, it had to be disposed of in some formal fashion before the Commissioner could refer the case to the Board.[27] Quite frequently this took the form of a ruling that an entry under suspension could not be contested on the basis of facts already known to the government.[28]

In a sense the frequently quoted phrase "voidable but not void" most briefly describes a Board case. The key words in this phrase fix the narrow limits within which the principles of equity and justice could be applied.[29] If an entry was not voidable it could be passed to patent without action of the Board; if it was void it was fraudulent or defective to such a degree that the Board could do nothing to cure it.[30]

The third phrase that is characteristic of the decisions to refer cases for equitable adjudication is "good faith." This was regarded as an essential ingredient of a Board case. The pages of supplemental proof together with accompanying affidavits and documents which form the record in each case seem to have been assembled for the purposes of determining good faith and deciding the question of substantial compliance.[31]

Another limitation on the jurisdiction of the Board is contained in the oft-repeated admonition that ". . . its province is confined to entries so far complete in themselves, that, when the defects on which they are submitted have been cured by its favorable action, they pass at once to patent."[32] The restricted jurisdiction of the Board was reflected in the sparing use of its powers.[33] On many occasions the Commissioner of the General Land Office would be reminded that "equity cannot

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jurisdiction of the Board in settling equities is emphasized by Secretary Hoke Smith in the Gage case, December 28, 1895, *ibid.*, 21: 549–550. It is relevant to recall that "The Commissioner of the General Land Office under the direction of the Secretary of the Interior is authorized to enforce and carry into execution by appropriate regulations every part of the provisions of this title not otherwise provided for." Sec. 2478, *Revised Statutes of the United States*, quoted by Secretary Vilas in the Eveleth case, L.D., 8: 91.

[25] Sec. 2457, *Revised Statutes of the United States*, 1873–1874, p. 452.

[26] Secretary Henry M. Teller to Commissioner Noah C. McFarland in *McCarthy v. Darcy*, October 20, 1882, L.D., 1: 78–79; see also *Florida Railway and Navigation Company v. Hawley*, *ibid.*, 18: 236–241; and *Cooke v. Villa*, *ibid.*, 17: 210–212.

[27] Decision in *Rice v. Simmons*, July 22, 1914, *ibid.*, 43: 344–346.

[28] Secretary Smith to Commissioner Silas W. Lamoreux of the General Land Office, September 26, 1895, in *Gage v. Atwater*, *ibid.*, 21: 211; see also *Walker v. Snider*, *ibid.*, 19: 467–469; *Cooke v. Villa*, *ibid.*, 19: 443–446; and for earlier cases see, *ibid.*, 17: 255 and 14: 83–85.

[29] The most complete discussion of this question is in a letter by Secretary Smith to the Commissioner of the General Land Office, March 21, 1894. The case under consideration was *Florida Railway and Navigation Company v. Hawley*, *ibid.*, 18: 236–241.

[30] Secretary Carl Shurz to Attorney General Charles Devens, May 28, 1880, *Copp's Land Owner*, 7: 91 (September, 1880). An earlier case had been discussed by Acting Commissioner U. J. Baxter, July 6, 1877, *ibid.*, 4: 68 (August, 1877). See also Graham case, L.D., 6: 767–769; and Blank case, *ibid.*, 17: 506–507.

[31] Secretary Lamar in writing to the Commissioner of the General Land Office on January 25, 1886, emphasized substantial compliance as determinative of jurisdiction, *ibid.*, 4: 350. See also Acting Secretary Chandler to Commissioner Groff, March 13, 1890, *ibid.*, 10: 299, and Acting Secretary Campbell to the Commissioner of the General Land Office, July 10, 1905, *ibid.*, 34: 40–41.

[32] Secretary Chandler to Commissioner Stone, August 9, 1889, *ibid.*, 9: 230–231; quoted in Richter case, *ibid.*, 25: 2. It should be observed that if an entry had passed to patent the outstanding patent had to be canceled before the case could go to the Board. Secretary Lamar to Attorney General Augustus H. Garland, November 9, 1887, *ibid.*, 6: 314. See also decision in the Hagerman case, *ibid.*, 8: 183.

[33] Acting Secretary Thomas Ryan to Commissioner Binger Hermann of the General Land Office, July 22, 1898, *re* Patrick A. Quealy, *ibid.*, 27: 218.

create a right which the law denies. . .";[34] that the express provisions of law could not be circumvented by referring cases to the Board, thus permitting the Land Department to do indirectly what it could not do directly;[35] that it must deal with the record of a case as it was and not as it should have been; and that it could not change statutory requirements.[36] The Commissioner was never permitted to forget that the Board operated on the basis of equitable considerations. In appropriate cases the Secretary of the Interior would remind him that, "It is a familiar principle of equity jurisprudence that equity considers as done that which should have been done."[37] This comment obviously refers to cases under suspension because of dereliction in duty by local officials. In another case reference was made to, "The well established equitable maxim that what has already been done need not be again performed. . . ."[38]

Finally, no entryman could claim reference of his case to the Board as a matter of right.[39] Such action was completely within the discretion of the Land Department. This particular point forms the basis of the only case decided by the Supreme Court of the United States with reference to the Board of Equitable Adjudication. An entry under the Timber and Stone act had passed through the hands of several transferees on the basis of the final receipt of the local land office before it was suspended for fraud and cancelled. The land subsequently passed to patent to another party under the homestead law. The disgruntled purchasers under the original entry, citing a decision by a Circuit Court Justice in a comparable case, asserted that the cancellation of the entry by the Commissioner of the General Land Office should have been referred to the Board of Equitable Adjudication prior to such action. After reviewing the entire history of the Board and all of the relevant statutory provisions Justice Harlan speaking for the Court said,

> The purpose of the legislation was not to limit or restrict the general or ordinary jurisdiction of the land officers. It was rather to supplement that jurisdiction by authorizing them to apply the principles of equity for the purpose of saving from rejection and cancellation a class of entries deemed meritorious by Congress, but which could not be sustained and carried to patent under existing land laws.

Emphasizing the key words in the statutes that adjudications "shall operate only to divest the United States of the title to the lands embraced thereby" the Justice concluded that "it follows that only decisions sustaining irregular entries are required to be submitted to the Board for its approval."[40]

Quite apart from the light shed upon purely legal and administrative problems the materials relating to cases referred to the Board of Equitable Adjudication whether published in the *Decisions* or contained in the Land Office section of the National Archives, are full of information concerning the problems and conditions of settlement.[41] After

[34] Secretary Teller to Commissioner McFarland in *Bray v. Colby*, January 29, 1884, *ibid.*, 2: 79–80.

[35] *Ibid.*, 37: 287.

[36] Secretary Smith to the Commissioner of the General Land Office in the Lockwood case, April 18, 1895, *ibid.*, 20: 361; Secretary Chandler to Commissioner Stone, August 19, 1889, *ibid.*, 9: 291–293.

[37] Secretary Chandler to Commissioner Stockslager, April 25, 1889, *re* Melissa Cunningham, *ibid.*, 8: 435.

[38] Secretary Carl Schurz to Commissioner James A. Williamson of the General Land Office, December 20, 1880, *Copp's Land Owner*, 9: 35 (May, 1882).

[39] In a long opinion dated April 16, 1892, Secretary John W. Noble refused to refer forty timber and stone entries to the Board. This was one of many such cases. *United States v. Allard et al.*, L.D., 14: 395–407.

[40] *Hawley v. Diller, U. S. Supreme Court Decisions*, 178: 479–495, especially 493–494. First Assistant Secretary of the Interior Edward C. Finney discussed this matter at length in the Ben McLendon case, June 7, 1923, L.D., 49: 562–563. In addition to dealing with the main point, Finney held that there was no appeal from the decision of the Secretary to the Board.

[41] The present writer has studied a large number of cases on the basis of the individual packages of material presently housed in the National Archives. In order to locate a case, one must secure the exact description of the land from the published list of suspended entries and then ascertain the Final Certificate number issued to the entry by the local land office. In some offices this seems to be the same as the Register's and Receiver's number. The filing envelopes are arranged in numerical sequence on the basis of the final certificate numbers. The information contained in the Henry Meverden case is reasonably typical. This entryman was born in Prussia and came to Kansas by way of Wisconsin. A carpenter by trade, he did not own either horses or implements when he made his entry, but continued to work at his trade until he could establish himself. The information given is detailed even to the inclusion of the statement that he planted two acres of pumpkins one season. F. H. 2729, Kirwin Series, National Archives.

All National Archives cases will be cited by final

making substantial allowance for the obvious fact that the entrymen tried to place their cases in the most favorable light, there is significant data in the case files that cannot be obtained from any other source. The number, depth, and value of wells, the cost of breaking the land, and the kinds and cost of fencing are given. The types of housing, whether sod, stone, or frame, and whether floored, plastered and ceiled, are listed, together with the alleged value of each size and type. The number and kinds of farm buildings and their value, the numbers and kinds of livestock, the kinds of crops with estimated yields, the various types of farm machinery, and even the character of the home furnishings are contained in the documents.[42] The historian who has an antiquarian interest in primitive plumbing facilities will be intrigued by the frequent references to "out-houses," "commodes," and "thunder-mugs."[43] Something of the social life of the community is revealed in the references to exchanging work and visiting with the neighbors.

The particular cases of settlers whose entries were in a state of suspension range from the tragic to the comic. The abandoned wife with the inevitable brood of four to nine children who could not prove up on her husband's entry appears frequently.[44] In connection with one such case in Kansas it was alleged that the woman's husband sent her on a visit to Missouri, relinquished his entry for a price, and used the money to elope with his neighbor's wife.[45] In another Kansas case, Wilhelm and Wilhelmina thoughtfully entered adjoining tracts of land, but married too soon thus sacrificing Wilhelmina's status as a qualified entrywoman.[46] The cases of immigrant entrymen who died before making final proof or becoming naturalized and the unfortunate settlers who became insane prior to proof add another type of variety to the study of Board cases.[47] The frequency with which "ignorance of the law" is alleged as an excuse for failure to comply with it raises some important questions concerning the early settlers; whereas the information concerning storms, droughts, floods, health conditions, crop failures, grasshopper invasions, and transportation facilities has obvious relevance to basic studies of frontier conditions.[48] The principal point that is being

certificate number, the name of the local office, and the initials N.A.

[42] Mrs. M. M. Hurlbutt valued a twenty foot well at $20, 65 acres of breaking at $130, and a 12 x 18 frame house at $100. She had no farm implements and only one cow. Her list of home furnishings is impressive. F. C., 10,696, Kirwin, N. A. The A. Smith case is even more informative. He claimed a total of $1,775 in improvements, including an eight room house ($1,000), 3 wells ($100), 70 acres in cultivation ($150), and 64 acres fenced ($125). Even the outhouse and a one-half interest in a lister are mentioned. F. C. 10,724, Kirwin, N. A. The Silvanous Palin case is concerned largely with financial problems. The crux of the matter seems to have been that the entryman refused to make new proof for submission to the Board of Equitable Adjudication and thus relieve his entry of suspension unless the mortgage company which had already loaned him a substantial sum would loan him an additional $500. F. H. 9,576, Kirwin, N. A. John Van Dyke even included his "swill pail" in his long and impressive list of improvements. F. C., 13,757, Kirwin, N. A.

[43] A. T. Dwinelle mentions the "thundermug" along with swill pails, crocks, washtubs, looking glass, etc. F. C. 13,933, Kirwin, N. A.

[44] The problem involved in this type of case was mentioned as early as 1871, L.O.R., 1871, p. 31. It was discussed in considerable detail by Secretary Teller in *Bray v. Colby* under date of January 29, 1884, L.D., 2: 78–82. The individual cases that were referred to the Board are too numerous for citation. A particularly pathetic case occurred in Kansas when the husband of Sarah Fordyce threw her out of the door onto a plow, injuring her so seriously that she was rendered bedfast, and then abandoned her. F. H. 3087, Kirwin, N. A.

[45] *Copp's Land Owner*, 7: 38 (June, 1880).

[46] Secretary Smith to the General Land Office *re* Wilhelmina [(Huber)] Roth, May 13, 1896, L.D., 22: 528–529. She was allowed to prove up on the principle that "she should not be made to suffer by the mistake of her husband . . . ." In the Susan Herre case, *ibid.*, 10: 166–167, under date of February 13, 1890, Secretary Chandler summarized a typical case, emphasized the absence of an adverse claim (Funk case, *ibid.*, 9: 215), and said: "It strikes me that it would be a harsh rule, one which does not commend itself to the equitable side of our nature and judgment to hold that when this woman had fully satisfied the laws and the rules of the Department except remaining sole until after she had submitted her final proof, that she has forfeited her right to enter this tract. Such a rule is in restraint of marriage which neither law nor equity favors."

[47] An Oxford, Idaho, case involved both an absence of citizenship proof and insanity, *ibid.*, 11: 3–5. The Margaret Sinder case contains a great deal of information. She was a 66 year old widow who had not become naturalized. F. C. 4781, Kirwin, N. A.

[48] The filing packages contain affidavits by doctors as to illnesses, operations, general infirmities and the like; naturalization papers and certificates; affidavits

stressed here is that an almost infinite variety of problems and conditions seem to have been characteristic of the cases presented to the Board of Equitable Adjudication.

If one turns from the Washington scene as represented by the origin and location of data to the physical characteristics of particular entries, variety is again the keynote. In seeking information concerning individual tracts of land the present writer has used original survey notes, early atlases, the Plat and Tract Books, maps indicating ground water resources, and a series of maps prepared by the Soil Conservation Service of the United States Department of Agriculture indicating the kinds of soil and the drainage patterns. This phase of the study has been confined to the Board cases involving land entries located west of the Sixth Principal Meridian in Kansas. Only a meagre beginning has been made. The only conclusion that can be stated with any assurance is that any generalization would be extremely vulnerable. In some counties there are as many as fifty Board cases whereas in nearby counties there are as few as two. In some counties Board and contest cases occupy adjoining tracts, in others they seem to fall in different parts of the county. In one county the fifty-four Board cases are scattered indiscriminately in stream valleys, along projected railroad routes, and adjacent to the town-sites, as well as in the more remote sections of the area. In each of the nearly fifty counties the pattern of distribution seems to be different. The writer is well aware of the fact that locations within a county have very little significance apart from proximity to towns, especially county-seats, but the important fact is that on the basis of present knowledge no generalization can be made which will be valid. Moreover the diversity covers such a wide spectrum of possibilities that no sampling process can be devised that will provide an adequate answer to the question as to why one group of vulnerable entries passed to patent without contest and others were not only contested once, but several times. Certainly the reasonably complete analysis of the administrative principles and practices of the Board did not yield the answer. It is clear that individual cases were handled on their merits within a framework of rules as interpreted in explicit decisions.

There are bits of evidence to indicate that some important factors in determining the location of Board cases were at work. The most important of these is the contrast in the number of times that a tract, which was to become the subject of equitable adjudication, was entered and the number of entries on adjoining tracts. The Plat Books reveal that in a significant number of instances the Board tracts were entered only once or twice whereas the surrounding tracts were entered and relinquished so many times that the officials ran out of space on the plat.

In making this study the writer has not been unmindful of the fact that all sorts and conditions of men made the entries; that they had a great variety of objectives in mind; that the prevailing weather conditions whether of drought or abundant rainfall must have exerted an influence as did the general economic conditions at the time settlement took place; and that the views and policies of particular Commissioners of the General Land Office must have played an extremely important role in determining the number and distribution of the suspended entries. But having said these things merely serves to emphasize the complexity of the influences that were at work in the settlement of the public lands.

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describing particular crop conditions; and some reasonably complete descriptions of weather conditions.

A GREAT AGRICULTURAL ESTATE: NETHERBY UNDER SIR JAMES GRAHAM, 1820–1845[1]

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English agriculture in the nineteenth century achieved a standard of excellence scarcely reached elsewhere in the world. This accomplishment was in large measure due to the efforts of England's landlords and their agents. It is the aim of this essay to trace the story of a single great estate where landlord and agent early in the century started a joint career of systematic improvements that was much of a piece with agricultural undertakings throughout rural England at a later time. The estate was Netherby, in Cumberland near the Scottish border; and its owner was Sir James Graham, well enough known for his high place in the nation's politics, but less reputed as an improving landlord. Netherby's agricultural story in the nineteenth century is worth telling and, what is more, adequate records remain that make it possible for the story to be told in some detail.

Netherby's farming in 1820 was full of neglect and decay, redeemed only by the fact that many other estates in the English countryside were similarly afflicted. It was not hard at this time to find good farming in such regions as the Northumbrian border country, Coke's East Anglia, and the Lincolnshire wolds. But go elsewhere and slovenly agriculture was relatively easy to find; "in many quarters," remarked two reliable observers, "there is an absence of all system—no principles are acted upon, nor is any operation guided by any rule or dictum of science."[2] Even on the lands of the sixth Duke of Bedford, an agriculturist of considerable standing, there was much that a later generation would deplore.[3] In this company Netherby took a conspicuous place.

Roughly 26,000 acres in size, the main body of the estate (about 21,000 acres) lay in the parishes of Arthuret and Kirkandrews through which the River Esk flowed. On the banks of the Esk, not far from the Solway Firth, stood Longtown, the chief village of the estate, and about three miles beyond stood the big house in a park overlooking the river. It was estimated that about 19,000 acres was arable land, and of this about 6000 acres was said to be first-class.[4] Plainly the estate had much second-rate and inferior land, but far more could have been done with it than its owner, Sir James's father, had so far managed to do.

Many years later an agent of the Grahams described the state of Netherby's agriculture in 1820.[5] There was much in his account that brought Irish farming to mind: small holdings, a teeming and squalid tenantry, and a land that lay half-submerged in water. Furthermore Sir James's father, if not an absentee, knew little and cared less about the business of a great estate, and his steward, a Mr. Ellis, presumably was not the sort of man to stir things up without his master's prodding and encouragement.[6] Ellis was aware of what needed doing, as his survey of the Netherby farms in 1819 indicates; but neither he nor his master were of a mind to do it.

[1] This subject has been dealt with by Professor A. B. Erickson in *The Public Career of Sir James Graham* (Oxford, 1952), chap. 4 and in "Sir James Graham: Agricultural Reformer," *Agricultural History* (July 1950); but Professor Erickson unfortunately made no use of the estate papers available at Netherby, from which this article has been mainly derived.

The author acknowledges his gratitude to Sir Fergus Graham and Major Charles Graham by whose courtesy he was able to examine the Netherby papers. He is also indebted to the Equitable Assurance Society of London, England, for permission to consult its archives.

[2] L. Kennedy and T. B. Grainger, *The Present State of the Tenancy of Land in Great Britain* (London, 1828), 25.

[3] Bedford MSS., in the Duke of Bedford's Estate Office, London, *passim*. The seventh Duke and his chief agent, Christopher Haedy, found in 1839 that the farming both on the Devon and the Fens estates was backward and in great need of improvement.

[4] Private Statement of Estate Matters 1818–45. Netherby MSS.

[5] W. Dickinson, "On the Farming of Cumberland," *Journal of the Royal Agricultural Society*, 13: 207–300 (1852).

[6] W. T. M. Torrens, *The Life of Sir James Graham* (2 vols., London, 1863), vol. 1, *passim*.

Rose Trees, later to become one of the best farms on the Netherby estate, was described by Ellis as being excessively run down by its numerous tenants and by consequent sub-division; so were Low and Upper Moat farms, the last being 189 acres in size and carrying six tenants. Frequently the tenants were ignorant of good farming, and often unable anyhow to improve their ways for lack of ready money. At Rose Trees, for example, one Irving was insolvent: he "has too many of his wife's relatives and acquaintances to keep, ever to enable him to recover," Ellis noted. And there was Irving's neighbor, George Graham, who was "an idle fellow and for years has been suspected of poaching"; and at Ellerycleugh, George Palmer, who was "a gambling cock-fighting fellow to whom it is no charity to show any indulgence by allowing him to run into arrears of rent." Remarks of this sort often appeared in Ellis's survey of the Netherby farms.[7]

Conceivably Ellis understood the necessity of reducing the number of tenants, of removing the incompetent and the bankrupt, of laying farm to farm in the interest of a more efficient and productive tillage, and of introducing new crops and techniques. But the work of putting Netherby on a sound footing remained for the coming generation, for the young heir who set about his reforms in the early 'twenties by dismissing Ellis when he could not provide a regular accounting of the estate's finances. Sir James put in his place a new agent from across the border where farming practice kept well abreast of the most advanced agriculture. The new man was John Yule, who was to help make Netherby a great agricultural estate, a model of good farming in an age when more and more of England's nobility and gentry vied to outdo one another in the arts of husbandry.

Sir James succeeded to Netherby at a time when the financial condition of landed gentlemen was precarious. They had been spending too much in the good years after 1800, enough to prompt the Tory cabinet in 1823 to consider seriously a large loan to English landlords "for paying off mortgages contracted between the years 1800 and 1819."[8] At the same time agricultural prices began to fall sharply, and the income of landlords diminished as they came to the aid of their tenants. High spending and falling rents were especially grave matters when landed gentlemen had to face the competition in society and politics of new classes whose wealth piled higher by the year. It was therefore imperative that men like Sir James Graham look carefully into their private affairs. The business of the landed estate demanded—more than ever before—that it be managed with method and regularity, with efficiency and economy.

Sir James was well able to provide Netherby with these things. Although born in 1792, and therefore of an age to be touched by the frivolities of the Regency, the young baronet was sober and prudent. He was to make for himself a reputation at Westminster as a man of business, and what he did there he did also on his estate.[9] At all times Sir James insisted that his steward keep him informed of the minutiae of landed business. And being an enthusiast for agricultural science, he kept his own mind well-stocked and critical. He had read Adam Smith and Ricardo and had pondered their significance. Perhaps the great masters of political economy helped fill his brain with the vision of growing productivity on the farms of England.

Of this possibility he had first learned from neighboring Cumberland gentry like the Throckmortons, and especially the Curwens of Workington Hall.[10] Here he saw landlords actively encouraging industrious and progressive tenants; and here conceivably he was touched by a faith in the beneficent results of a systematic knowledge of nature, of making agriculture an applied science. In the first half of the nineteenth century, rural England, no less than Manchester, held forth on the marvels that would come to sight as men peered into nature's mysteries. Although Sir James's temperament forbade his being the easy optimist, he never left off recommending that those who farmed should unite science with improved practice. In the 'thirties, as chairman of a parliamentary committee on agricultural distress, he brought forward James Smith of Deanston, the Scottish drainer, who set the English agricultural world by the ears. It was Smith's methods, as tried at Netherby, that Sir James described in an early article of the *Journal of the Royal Agricultural*

[7] Survey of the Netherby Farms, 1819. Netherby MSS.

[8] Additional Manuscripts in British Museum, London, folios 38291, 389–390.

[9] A. B. Erickson, *The Public Career of Sir James Graham* (Oxford, 1952), *passim*.

[10] *Ibid.*, 14; Hugh Lonsdale, *The Worthies of Cumberland* (2 vols., London, 1867), 1: 36.

Society. He had been a founder of this new society; and its journal, he explained, should be nothing less than "an authentic record of practical experiments; . . . by multiplying facts and proofs of this description agriculture will be treated as a science. . . ."[11]

Inevitably a landlord so disposed would choose his agent with the utmost care; for few things in the management of a landed estate warranted more serious consideration. Landed gentlemen were so much taken up with politics and administration, both national and local, that numerous and heavy duties fell to the agent or steward.[12] First, there was the management of his master's economic affairs, agricultural and sometimes non-agricultural, ranging from the drawing up of leases and the collecting of rents to spreading a better knowledge of husbandry among the tenants. The agent also took a leading part in the politics, government, and society of the locality. He conducted his employer's electioneering, sat on the poor-law union and sometimes (if he served a great landlord) on the commission of the peace, and was at all times ready to give advice and settle disputes and generally guide the lives and doings of tenants and laborers on the estate. It was the good fortune of English landed gentlemen in the nineteenth century to find a race of men who performed these many labors with skill and devotion.

Not a few came from Scotland, as did John Yule: men who were among the most accomplished in their calling, like Francis Blaikie at Holkham (Coke of Norfolk's trusted agent), and Andrew Thompson who served Ralph Sneyd at Keele Hall in Staffordshire. Often they were farmers' sons, "bred to the soil from my cradle" as Yule put it, and thus brought up to the profession by fathers who had farmed and done an agent's work and had taught their sons all that they knew. This schooling was a good one, scarcely improved upon by the professional training of a later day. An agent like Yule was familiar with the best in English and Scottish farming, and, what was equally important, he was filled with a high sense of the value of preserving his master's interests and thereby the landed society of the English countryside.

Yule's devotion to Netherby and the Grahams is easily shown. He carefully nurtured his master's political interest in the county of Cumberland, in spite of the fact that the varied and burdensome business of electioneering repelled him. He mastered the details of electoral organization—selecting agents, canvassing tenants, and publishing broadsides; and he devised many ingenious tactics.[13] In 1835, when Sir James's forces in the county needed strengthening, Yule persuaded his master not to be overly delicate about creating extra votes on the estate by making joint tenancies. After all, he warned, "all men of your rank and property in land will soon be compelled to follow your example, if they would maintain their proper station in society, and prevent the landed interest from being swamped by the too preponderating strength of the Towns."[14]

Yule sometimes thought more about keeping the landed interest strong than his master did. Sir James was prone to severe fits of melancholy, when it seemed to him that it was all up with his order and with Netherby. At these times he would seriously contemplate the sale of considerable portions of Netherby and Yule would be asked to draw up detailed schedules indicating how much better off Sir James would be if he sold. These moments of despair were probably no less trying for Yule than for Sir James, and at least once, in 1826, the agent was moved to speak out strongly against selling.

> I confess I felt most acutely your last intimation at parting—I have honestly done my very utmost to improve this great Estate, and plebeian though I am, I cannot bear to see it go out of the possession of an Honourable old family who have always been beloved by their retainers, into the hands of a Hard hearted grinding Speculator without lifting up my humble voice—against such a measure, which if I know anything at all of Human Nature—I think fraught with great mischief in the first place to a devoted race of men born and bred on the soil, but with endless regret to their natural Lord, a regret which no power that the most ample fortune can give will ever repay.[15]

Perhaps Yule's dismay touched Sir James during this and other crises in Netherby's affairs. For

[11] Sir James Graham, "On the Deanston Frequent Drain System," *Journal of the Royal Agricultural Society*, 1: 29 (1840).

[12] See David Spring, "The Earls of Durham and the Great Northern Coal Field," *Canadian Historical Review*, 33: 237–253 (Sept. 1952), for an account of another estate agent.

[13] Letters of John Yule to Sir J. Graham, *passim*. Netherby MSS.

[14] Yule to Sir J. Graham, June 8, 1835. *Ibid*.

[15] Yule to Sir J. Graham, Nov. 12, 1826. *Ibid*.

the estate remained whole, and the fortunes of the family were improved in less spectacular fashion; not by sale but by a slow and patient reform of Netherby's economy. The brunt of this labor naturally fell upon John Yule, as Sir James was often occupied elsewhere. But they worked closely together, and it was Sir James—usually informed in detail by Yule—who made many of the vital decisions: not to sell, to borrow for improvements, to give a tenant notice, and to select another in his place from a list drawn up by Yule.

The first step taken by landlord and agent when they joined forces was to borrow ready money at the lowest rate of interest available. Sir James's father had already learned that a good place to go for a large supply of cash at a reasonable price was one of the leading insurance companies in London. In 1815 he had gone to the Equitable Society for £30,000 and three years later for a further sum of £25,000. The Equitable was the largest company in the country, and had early resolved to lay out a substantial part of its accumulated capital "upon good mortgages." In 1817 the Society had decided that a million pounds would be used for this purpose, and by 1825 had raised this amount to three million.[16] In this way the savings of the nation helped in a significant manner to finance the economy of the English landed estate. Walter Bagehot was well justified in remarking that "a large part of the titles of our richest landowners are mortgaged . . . to insurance offices who have much money constantly to lend."[17] Certainly the Mortgage Books of the Equitable looked not a little like a roll-call of the British peerage.

Sir James, who had approved of his father's borrowing from the Equitable,[18] went himself to this company in 1825, adding £45,000 to the £55,000 of debt contracted earlier. He returned several times in the following decade, so that by 1838 the Equitable Society had advanced £200,000 on security of Netherby land,[19] a sum which represented almost his total indebtedness and which he continued to bear until the end of his life in 1861. In making the Equitable his principal creditor, he had acted with good reason. Since borrowers on mortage paid all the bills, those of the lender's solicitors as well as of their own, it was wise to consolidate debts and to deal with as few mortgagees as possible. What was more, an insurance company was a most suitable mortgagee, being a large supplier of money at a comparatively low rate of interest (3½ per cent), and not likely to be in a hurry about repayment so long as the interest was punctually discharged.

Like his father who had raised £55,000 with the Equitable—in large part to meet family payments—Sir James also had to provide for such charges. This was the customary toll levied on each generation of eldest sons—a jointure for the dowager and portions for younger children. In addition, there were some debts of his own making. He had rented and furnished a London house, and had stood for election at a variety of places—Hull, St. Ives, and Carlisle. Finally Sir James needed money to finance the ambitious scheme of improvement that he and Yule had in mind for putting Netherby on a new footing.[20] He was not of a mind to agree with Polonius that borrowing dulled the edge of husbandry.

Not everything that had to be done at Netherby cost money. Selecting better tenants and taking pains to instruct them incurred little in the way of expense. But new farm buildings, miles of draining tiles, roads and bridges—these had to be paid for and provided as soon as possible, otherwise good tenants would scarcely stay at Netherby. To plant well-to-do and knowledgeable farmers on the Grahams' land and to put at their disposal an improved capital equipment, was the twofold object of Sir James and his agent. Indeed, as the century wore on, this became increasingly the object of England's landed gentlemen. They were, in consequence, more than collectors of rent. They set the standards of good farming by teaching their tenantry and by contributing materially to what was in fact a joint enterprise.

Consider the substantial changes that were worked by the owner of Netherby in what might be called the fixed capital of the estate. Large tracts of land were taken in hand—sometimes four to five thousand acres—and put in such a state of working order as would render the farms attractive to desirable tenants.[21] In 1838 Yule

[16] Equitable Society MSS.

[17] Mrs. Russell Barrington, ed., *The Works and Life of Walter Bagehot* (10 vols., London, 1915), 7: 252.

[18] Letter of Sir J. Graham to his Father, March 1815. Netherby MSS.

[19] Mortgage Books. Equitable Society MSS.

[20] Statement of Netherby Debt, 1828, showing the cause of the Increase since 1815. Netherby MSS.

[21] Dickinson, "On the Farming of Cumberland," 13: 222.

reported to Sir James that "the Bridges at Redbank are getting on ... and if time allows I am thinking this season of completing the Bridge and Road through Briscohill meadows ... a good road will be an inducement to a good farmer."[22] The following year saw more evidence of continuing work at Briscohill: "all the old—dikes are down, and all the ruinous houses on the East side of the Yard are removed. We apply the clay to the adjoining lands—The new fences are in progress as well as the Draining—the cutting and dressing of the present quick hedges etc."[23]

Thus the extensive work of reconstruction proceeded: the draining, the new farm houses, the roads and bridges, and the planting. The last was undertaken on a large scale. By 1845, of 2300 acres of existing woodland, 1300 acres had been planted since 1818.[24] Planting of course afforded shelter to cultivated land and put to use some of the inferior soils. It also helped to diversify the economy of the estate. In the 'thirties Yule looked into the possibility of establishing a bobbin mill for the manufacture of wooden spindles used in the textile industry; and in 1837 he induced a contractor to set up a mill at Netherby, renting him a building and providing the timber at a reasonable price.[25] This gave employment in the neighborhood and, more important, sustained the wood sales which helped to defray the cost of Netherby's improvements.[26]

From the building of roads and bridges it was a short step for Sir James to the active encouragement of railways seeking access to his estate. So long as he got a reasonable price for his land and was assured that his privacy was not threatened, he championed Cumberland railways with enthusiasm. So did his neighbour, the Duke of Buccleuch, who had a calculating eye on the future development of his collieries. Sir James also entertained hopes of finding coal and some borings were made, although without success. But this left him no less devoted to railway building; for he saw plainly that the new means of transportation would benefit agricultural as well as mineral lands. And when he was sure by 1847 that, in consequence of his adroit negotiations, three lines were to be laid across his property, Sir James, who was given to gloomy utterances, exclaimed with unwonted glee and triumph: "I consider myself on Velvet ... immense benefits will be conferred on my Estate. It will do more to restore prosperity to my concerns than any other transaction of my life."[27]

If Sir James and his agent acted alone to provide the capital equipment of Netherby's agriculture, in other ways they shared the burden with the tenant. Draining, for example, was conspicuous among the joint contributions to the farming economy of the estate. One of their first acts was to bring a tile-maker to Netherby, a personage hitherto unknown to Cumberland agriculture.[28] His services were much used, for landlord and tenant often agreed to drain together, the one supplying the tiles, the other laying them in the earth and paying for cartage and labor. Yule would be at hand to advise on how the work should be done. The advice was good, for Yule kept abreast of the most advanced opinions like those of Smith of Deanston. Between 1822 and 1846, about 4800 acres were drained in this fashion, which required almost a thousand miles of pipe.[29] This was separate from the draining done by the landlord on the farms that he took in hand.

Much of the effort to make soil, cattle, and men give of their best would have been in vain if landlords and agents had not taken pains with the selection and education of their tenants. At Netherby this was an axiom of estate management, and Yule, in particular, followed it closely. The radical reduction in the number of tenants testified in part to the zeal of the agent. Between 1823 and 1851 the number of tenants at Netherby fell from 300 to 140, as the incompetent were weeded out and farms were enlarged and entrusted to those persons best able to work them well.[30] By the 'forties there was not a farm on the estate that was afflicted as in an earlier time by a swarm of squatters; and wherever profitable, farm was laid to farm to make a more efficient holding.

[22] Yule to Sir J. Graham, May 3, 1838. Netherby MSS.

[23] Yule to Sir J. Graham, Feb. 14, 1839. *Ibid.*

[24] Private Statement of Estate Matters 1818–45. *Ibid.*

[25] Yule to H. McDonald, April 19, 1837. *Ibid.*

[26] Sir J. Graham to M. Brown, April 18, 1857. *Ibid.*

[27] Sir J. Graham to Yule, April 17, 1847. *Ibid.*

[28] Dickinson, "On the Farming of Cumberland," 13: 286.

[29] Memorandum, 1846, in Yule's Letter Book. Netherby MSS.

[30] Dickinson, "On the Farming of Cumberland," 13: 224.

Thus Rose Trees had one tenant instead of six, and Bush on Esk, the best farm on the estate, had grown from 392 acres in 1819 to 824 in 1841.[31]

In that year, as in 1819, Thomas Wilkin was still tenant of Bush on Esk, and names like Ferguson, Gibbons, and Wilkin continued to appear throughout the century among the Netherby tenants. Farms were often handed down from generation to generation, and Sir James and his agent preferred to see it this way so long as a particular family farmed well. Even if the farming deteriorated, Yule and Sir James were inclined to treat the tenant gently. In 1839 there was the case of Robert Ferguson at Bush on Lyne whose forefathers, as well as himself, had "for many years been farmers under the Netherby Family."[32] Ferguson was in arrears, a chronic state of affairs with him, and Yule gave him notice. But he was not callously turned off the estate. A choice was offered him of an annual allowance or "a small possession," and he chose the latter.[33]

At the same time long standing could never excuse poor farming or its likely consequence, arrears of rent. In the 'twenties arrears were common; but by 1835 they were infrequent and audits took place when not a single tenant defaulted—a notable achievement in the 'thirties. Yule might wait as long as eighteen months for a tenant to pay his rent, during which time the offender was prodded and cajoled into full and regular payment. Harshness and caprice were avoided, even when dealing with farmers who were comparatively new to Netherby. In 1842, Rae of Briscohill—a new man—was known to be violating the terms of his lease by taking hay off the estate for sale in Carlisle, and he was warned more than once about his reprehensible behaviour.[34]

In seeking new tenants Yule always sought first for men who were known to him as persons of capital and skill. To advertise and bring in strangers was the last resort when the resources of the neighborhood and the county had been thoroughly and unsuccessfully explored. Good farm houses, roads, and bridges were some of the things calculated to bring desirable tenants to Netherby. A long lease was another and in Yule's opinion nothing was more important to agricultural improvement. He had the Scottish dislike for the yearly tenancy which was so widespread south of the Tweed. The English custom, according to Yule, was "a complete ban to all improvement" and no good tenant would work under it.[35] He was astonished to find in 1841 that Sir Robert Peel's tenants at Drayton farmed without a long lease. At Netherby, although the small farms were occupied at will, the "best farms" as Yule called them were held on long lease, usually for 14 years.

All holdings, under short or long lease, were subject to a written agreement which Yule took care to explain to tenants, who were sometimes surprisingly ignorant of the customary regulation of their farms. Tenants were free of tithe, but paid all taxes and rates, and were obliged to insure the farm. Houses, gates, fences, and embankments came to them "in good tenantable order at their entry," and with some assistance from the landlord, they were expected to keep them so. They were forbidden to plough up pasture; to take more than one white crop from arable without a green hoed crop or fallow intervening; or to sell potatoes off their land. With tiles given free at Sir James's kiln, tenants were expected to complete a thorough underdrainage of their whole possession within four years of entry. These were the chief articles of the agreement and they applied universally, although in some cases a special bargain was struck, usually with a long leaseholder. Robert Bell came into an enlarged farm in 1848 and he pledged himself to drain 15 acres annually, to reserve 10 acres of his land for planting by Sir James, and to rearrange his fields, in return for which his landlord was to build a new barn and a new dwelling house. Bell held his farm under a lease for thirteen years.[36]

The written agreement compelled the minimum of good farming. It was another thing, as Yule saw, for tenants to make the most of what nature and an enlightened landlord had given them. Yule made himself familiar with every corner of the vast and far-flung estate and with the capacity and disposition of every tenant upon it. Yule knew them all: how they farmed, whether they were good *pères de famille*, how they voted; and he took it upon himself to act as their guide and mentor. His advice inevitably went beyond the business of farming. They brought their quarrels

[31] Measurement and Valuation of First-Class Farms, 1841. Netherby MSS.

[32] Yule to Robert Ferguson, July 9, 1839. *Ibid.*

[33] Yule to Sir J. Graham, Nov. 30, 1840. *Ibid.*

[34] Yule to W. I. Rae, Jan. 28, 1842; June 14, 1843. *Ibid.*

[35] Yule to Sir J. Graham, Mar. 17, 1841. *Ibid.*

[36] Lease book. *Ibid.*

and personal troubles to him, and he played the arbitrator and keeper of the peace. He even sought to direct their social life. In 1836 the leading tenants at Netherby were anxious to have a coursing club. Yule objected; it led to gambling and idleness; "the same remark," he added, "applies to their races of which they are so fond."[37]

Good habits helped make good farmers, and if tenants must have clubs Yule preferred, indeed insisted, that these deal in more sober and useful matter such as the new methods of husbandry. Hence one of his first achievements was to organize the Netherby tenants into a local farmers' society. Yule was its vice-president, and Sir James Graham presumably its president. Each year, at the annual cattle show and meeting at Longtown, tenants competed for premiums offered by the society: for the best managed turnip crop, the best bull of Galloway breed, the best three-year old cart horse bred at Netherby and so on. In addition, Sir James offered prizes to the most ably managed of each class of farm on his estate: "a silver tea pot of ten pounds value," for example, to the most efficient of his large farms, the criteria being such things as "the greatest breadth of well manured and thoroughly cleared bare fallow on the strong lands," the state of farm buildings, water-courses, gates, and fences. And if a tenant's Galloway cow came up to mark, he awarded the service, free of expense, of one of his prize bulls.[38] Homely but effective as this was, Netherby's farming, like the nation's, benefited much from its local farmers' society whose counterparts spread in the nineteenth century to every corner of agricultural England.

The crucial test of Yule's guidance and leadership came in the early 'forties when a large number of Netherby's farms were up for re-letting. Although large improvements had been made, the question still remained to be answered whether the tenants would pay higher rents, adequate to the capital outlays of the past two decades. Unfortunately the times were not good. There was much uneasiness in rural England; for the Anti-Corn Law League was already at work and farmers were discomfited by the reports that came back from Westminster, of renewed discussions on the vexed question of the Corn Laws. Yule was himself sanguine, but he informed Sir James that every tenant had signed a petition decrying any tampering with the protection of agriculture.[39]

The anxiety of farmers deepened during the next few years, as agricultural prices fell and Peel's government showed signs of hostility to the tariff on farming products; and Yule too grew disturbed, faced with the prospect of new lettings. The arrangements for the second-rate farms, however, were made early and quickly enough to Yule's satisfaction. But the "best farms"—such as Bush on Esk (824 acres), Mossbandhall (653 acres), Guards (606 acres), and Rose Trees (527 acres)—were another and more difficult matter. By November 1841 Yule was prepared to enter negotiations with his leading tenants. Measurements, plans, valuations, and proposals were all in a state of readiness. In the following January Yule wrote to Sir James up in London that "the let of your best farms I have taken the liberty always to say, I considered a subject of deep importance to the future prosperity of your Estate."[40] And then some days later he wrote again warning of the "great difficulty in coming to fair arrangements with certain of our higher class Farmers."[41]

The new valuations on the "best farms" had raised the rents in some instances as much as 20 per cent,[42] and Yule found by the opening months of 1842 that the big tenants were holding back. "Your leading men," he informed Sir James, "are a set of cunning fellows and very ill to manage. . . . At the same time I will be very sorry indeed to part with any of these men."[43] By the middle of March, however, Yule came to the distasteful conclusion that if "I cannot let on fair and equitable terms, as fixed on by yourself, I must advertise immediately afterwards."[44] He was not without sympathy for these men who threatened to frustrate his years of hard work. "All are dreadfully alarmed at the proposed change in the Tariff respecting the importation of provisions."[45] But he went forward firmly with his determination to advertise, after waiting for some months until the virtual panic had subsided amongst the tenants agitated by the new legislation.

[37] Yule to Sir J. Graham, Feb. 25, 1836. *Ibid.*

[38] Printed circular of the Netherby Farmers' Society. *Ibid.*

[39] Yule to Sir J. Graham, Feb. 11, 1839. *Ibid.*

[40] Yule to Sir J. Graham, Jan. 10, 1842. *Ibid.*

[41] Yule to Sir J. Graham, Jan. 19, 1842. *Ibid.*

[42] The rent of Rose Trees, for example, was raised from £602 to £714.

[43] Yule to Sir J. Graham, Feb. 10, 1842. Netherby MSS.

[44] Yule to Sir J. Graham, Mar. 14, 1842. *Ibid.*

[45] Yule to Sir J. Graham, Mar. 29, 1842. *Ibid.*

At the beginning of July the large farms were advertised in the leading newspapers throughout Scotland and the north of England. To his evident surprise, few strangers showed an interest in Netherby. "Although," he wrote to Sir James, "we have the best farms in the North of England, I do not remember anything so dull as this."[46] A Mr. Bonstead from Lincolnshire came to inspect the farms, but his ideas did not meet with Yule's on how best to cultivate them.[47] Then, as Yule had perhaps foreseen, his tenants' resistance broke. It is not clear from the evidence how this came about; perhaps the public advertisements had done the work of persuasion. At any rate, all but one of the best farms were taken up again by the old tenants, and presumably on Yule's terms, as the accounts indicate a substantial rise of rent. He had played his hand well, and had conducted himself as he thought an agent should. "I have since early youth," Yule wrote in 1838, "had the management of numerous sets of Tenantry—some of them ill enough to guide, but as yet I have never failed, by just, determined and firm conduct to carry my point."[48] In 1842, after the severest tests of his career, he could still make that boast.

What did Yule's triumph mean for Netherby's finances? Since Sir James showed an almost morbid curiosity about the details of his personal finances, and was constantly drawing up elaborate balance sheets, this is easier to answer than on most landed estates of the time, where landowners behaved in a fashion more typical of their class. Between 1819 and 1845, Sir James's total outlay for improvements amounted to roughly £93,000. This sum was broken down as follows. On planting the landlord had expended £6,054; on lime given to various tenants under special agreements, £963; on the repair of old buildings, and on new farm houses, cottages and bridges, £36,420; on improving various farms "occupied at sundry times by the proprietor before they could be got relet," £28,612; on tiles for underdraining, given free to tenants, £12,420; and "on defending the Lands from rivers and the Sea, making New Embankments, flood gates, etc.," £7,874.[49]

On this expenditure of about £93,000, the landlord's return may be indicated as follows. Netherby's gross rental from farming rose from £17,946 in 1818 to £21,599 in 1845. A large part of this increase presumably appeared towards the end of the period under examination, when the farms were re-let. Had Sir James laid out his money in Consols, the return on his investment would have been several hundred pounds less than the return from agriculture after re-letting; before re-letting, the return on Consols would have been considerably larger than his agricultural return.[50] Considering his long years of effort and risk, the reward even at the best of times was scarcely gratifying. One suspects that such was the state of affairs on many of England's landed estates in the nineteenth century; and that as Jorrocks once put it, "land-ownin's a *werry* poor trade."[51] Needless to say, no merchant or manufacturer would find Sir James's reward an adequate one;[52] and the owner of Netherby had to find satisfaction, so far as economic arrangements were concerned, in the knowledge that his improvements had staved off a disastrous decline.

In 1845 these considerations brought small comfort to Sir James, and he yielded to the temptation of looking at his affairs as a merchant would. He thus estimated that, of £21,638 of gross rental, he took £7650 a year for interest on his indebtedness and almost that sum again for annuities and pensions and the general expenses of upkeep and management on his estate, thus leaving himself a net income of £7000. This was not an especially comfortable income for a landed gentleman owning 26,000 acres and having to meet the responsibilities of high station, public life, and a considerable family. What was more, if the rate of interest on his debt rose from 3½ to 5 per cent—as Sir James was gloomily aware it might in the event of war or some public crisis—then his net income would fall to £3700.[53] He had

[46] Yule to Sir J. Graham, July 15, 1842. *Ibid.*

[47] Yule to Sir J. Graham, July 7, 1842. *Ibid.*

[48] Yule to Sir J. Graham, April 27, 1838. *Ibid.*

[49] Private Statement of Estate Matter 1818–45. *Ibid.*

[50] Arthur David Gayer, Walt W. Rostow, and Anna J. Schwartz, *The Growth and Fluctuation of the British Economy 1790–1850* (2 vols., Oxford, 1953), 1:289, 320.

[51] Robert S. Surtees, *Hillingdon Hall* (New York, 1933), 356.

[52] Ashworth, the Lancashire cotton spinner, felt that he ought to make a profit of nine or ten per cent; four per cent on his capital and four to five per cent on top of that. See House of Lords, *Report of Select Committee on the Burdens affecting Real Property* (1846), 6:321.

[53] Private Statement of Estate Matters. Netherby MSS.

always been conscious of these difficulties; in 1845 he felt them keenly.

In March of that year he communicated to his eldest son a determination to sell a large portion of Netherby. Sir James explained that he might be turned out of office any day thereby losing his official salary; that the rate of interest might rise costing him some thousands more; and that he had many children to provide for. Now, therefore, was the time to sell; in a little while it might be too late.

> The Country is prosperous; money is abundant; the Estate is in as good order as it will ever be; and I see coming events which are inevitable, but which will materially affect both the value and the pleasures of Landed Estates. The Corn Laws cannot long be maintained; and the days of the Game Laws in this country are numbered. Every prudent man encumbered with a heavy Debt, and with a large Family must naturally be anxious in these circumstances to retreat in good time from a position which he knows will not ultimately be tenable. And the family pride and local attachments, and a thousand Ties, which are most honourable and binding, make the sacrifice severe and heart rending. Yet Debt is an intolerable and degrading Burthen, and the payment of it is a paramount duty. At this moment having borrowed the money for your Commission last year under an Engagement to repay it in Twelve months, I have not the means of fulfilling the Pledge. I cannot endure this state of affairs, which oppresses me, and which renders all my possessions grievous to me instead of pleasurable.[54]

What Sir James did not make clear in this letter—probably because his son had already been informed—was how much better off they would be once Netherby was sold. He and Yule had estimated that if £700,000 (a low figure) were got by selling the estate, they could still pay off all the debts, provide for younger children, and invest the remainder at 3½ per cent, to yield an income of £15,048. Aside from family charges and his son's paying a mother's jointure, this sum would be subject to none of the many demands that arose in the course of owning a landed estate. Sir James's income would therefore be £13,868 instead of £7000, and his son's during the life of his mother, £11,868.[55] If they got 5 per cent on their investment, their net income would be further enhanced. In addition there would be few of the hazards of conducting a great agricultural enterprise, and no vexations from troublesome tenants.

Yet Sir James never sold nor did his son. For something more was at stake here than mere pounds, shillings, and pence. A great landlord stood in the front rank of England's governing class; to sell Netherby was virtually to vacate that position. Sir James was too much the landed aristocrat to go that far; and however deep his despondency, it was never such as to prevent him from believing that he might scrape by in his own time. At bottom it was not the pursuit of profit that informed the agricultural enterprise of a great English landed estate. Instead what moved it was the spirit of a traditional and hierarchical society led by the landed gentlemen of the nation. So long as that society was vital, so long as the owners of estates were accepted as England's rulers, landlords would show the persistence and ingenuity of Sir James Graham in his reform of Netherby's farming. But once these prerequisites were removed, the landlord's distinctive contribution to English agriculture would inevitably be discouraged. In Sir James's day, that melancholy revolution had not yet taken place. It was altogether fitting that tenants, agent, and landlord assemble in death as in life in the little churchyard of Arthuret, their tombs so placed as to indicate station and rank; the squire and his family set apart, their burial stones as simple as any; the agent a bit aloof from the cluster of tenants, but all suggesting nevertheless a unity of outlook and purpose.

[54] Sir J. Graham to his son, Mar. 29, 1845. *Ibid.*

[55] Private Statement of Estate Matters. *Ibid.*

FOOT AND MOUTH DISEASE IN MEXICO, 1946–1951

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The most serious problem confronting Mexican stockmen in recent years was foot-and-mouth disease.[1] The eradication of this disease was a challenge to stockmen's associations, the government, and indeed a large proportion of the Mexican population. It required the work of the best technicians, both Mexican and foreign, and the patience and cooperation of the livestock owners to bring the epidemic under control. The manner in which Mexican authorities, aided by others, attacked and solved this problem merits much praise; it is an excellent example of international cooperation.

Foot-and-mouth disease, known for centuries in many countries, is one of the most contagious of all maladies which attack cloven-footed animals. Cattle, swine, goats, and sheep are susceptible to it; it also attacks buffaloes, American bison, camels, deer, chamois, llamas, giraffes, and antelopes. It is caused by a virus so small that it cannot be seen with the most powerful microscope. Within one day to two weeks after the original infection, this virus attacks tissues of the tongue, cheeks, lips, mouth, feet, and other parts of the body, causing fever and blisters. The virus is difficult to kill; it has been known to persist in the field for 345 days. Infected animals have difficulty in feeding and walking. The principal ill-effects of the disease are loss of weight and a decrease in milk production; pregnant cows are apt to abort. The disease is most devastating to young animals. The death rate of infected stock, however, generally does not exceed five per cent.[2]

Foot-and-mouth disease spreads in many ways. Infection may result from direct contact with either diseased animals, or with feed, manure, utensils, drinking troughs, vehicles, railway cars, barnyards, and pastures. Human beings may carry the virus on their shoes, clothing, and hands. It may be transmitted by poultry, dogs, cats, rats, birds, and wild game.[3]

Certain notable events had taken place prior to the outbreak of this dreaded disease in 1946. On January 18, 1930, President Herbert Hoover announced the adoption of a treaty between this country and Mexico intended to protect livestock from infectious and contagious diseases. Each government agreed to prohibit importation of cloven-footed animals from countries in which foot-and-mouth disease existed.[4]

Mexican authorities did not adhere strictly to this pact. In the 1930's several shipments of fighting bulls from Spain entered Mexico and late in 1939, some sixty brown Swiss bulls from Germany were landed, although foot-and-mouth disease existed in both Spain and Germany. However, no epidemic followed these importations.[5]

The outbreak of foot-and-mouth disease in Mexico in November 1946, was traced to the importation of two consignments of Zebu, or Brahman, bulls from Brazil. In October 1945, after long diplomatic negotiations, 130 Zebus were landed on Sacrificios Island near Vera Cruz, and were brought to the mainland in December. A second shipment of 327 bulls from Brazil arrived at Vera Cruz in May 1946. They too were unloaded on Sacrificios Island, and on September

[1] Agricultural specialists prefer the expression "foot-and-mouth disease" to "hoof-and-mouth disease" in referring to this livestock scourge. In Europe it is called aphthous fever; and in Mexico, *aftosa* fever. The virus attacks membranes of the mouth and soft parts of feet of cloven-footed animals; but does not affect the hoof tissue. Hence the term "foot-and-mouth disease" is more descriptive and accurate.

[2] Senate of California, *Report on Foot-and-Mouth Disease*, 1947, pp. 9, 175, 196–198, 312, 431 (hereinafter cited as California Senate, *Report*). I am indebted to Dr. C. U. Duckworth, Assistant Director of Agriculture of the State of California, for this report and for two others for the years 1949 and 1951. See also Wendell C. Gordon, "The Foot-and-Mouth Disease in Mexico," *Inter-American Economic Affairs*, 3:42 (Winter 1949).

[3] California Senate, *Report*, 1947, pp. 176, 198–200, 247–251, 414, 416. Mexican game officials discontinued the issuance of licenses to hunt deer and wild pigs in the fall of 1947, in order to aid in the eradication work. See *ibid.*, 416.

[4] *Ibid.*, 12–13, 214.

[5] *Ibid.*, 35.

28 they were taken to the Mocambo Rancho near Vera Cruz despite considerable opposition by the Mexican press, stockmen's associations, and the protest of the United States State Department. The Department of Agriculture promptly placed severe restrictions on the entry of ruminants from Mexico.[6]

Early in October 1946, bulls in the second shipment were inspected by two Mexican veterinarians and found free of foot-and-mouth disease. Three weeks later these animals, still on the Mocambo Rancho, became sick. Mexican authorities were unable immediately to diagnose the disease; they thought it was vesicular stomatitis which occurs often in that part of the country. It quickly spread to the states of Puebla, Mexico, Tlaxcala, and the Federal District. Within a relatively short time livestock in all of central Mexico were suffering or exposed. The infected zone was bounded on the north by a line running roughly from Tampico in a westward direction to Puerto Vallarta on the west coast; and on the south, by an irregular line across the Isthmus of Tehuantepec.[7]

On December 18, 1946, the United States Department of Agriculture was notified of the outbreak, and on the invitation of Mexican authorities, promptly sent two expert veterinarians to help diagnose the malady. It was positively identified as foot-and-mouth disease. Accordingly, American authorities closed the frontier to all Mexican livestock, and established an efficient patrol along the border.[8] Mexicans viewed this action with alarm because their cattle exports to the United States had reached large numbers; for instance, during the period October 12 to December 27, 1946, 151,800 Mexican cattle entered the United States. There were approximately 2,000,000 cattle in the infected area and it was estimated that there were 9,000,000 cattle in other parts of Mexico. An area of immediate danger to American stock was Matamoros, Mexico, near Brownsville, Texas; some fifty of the Zebu bulls from Brazil were on several nearby ranches but they showed no symptoms of infection.[9]

The 1930 treaty provided that the two governments would aid each other in the event of an outbreak of foot-and-mouth disease or rinderpest. Accordingly, on December 30, 1946, the United States government invited Licenciado Oscar Flores, Secretary for Stock Raising, and Dr. Fernando Camargo, Chief of Laboratory Production, to Washington to consult with representatives of the Bureau of Animal Industry and the Office of Foreign Agricultural Relations. Here it was agreed that the Bureau of Animal Industry would send four veterinarians to join four Mexican veterinarians to make an intensive survey of the situation. The Bureau of Animal Industry was ready to mobilize its man power to prevent the spread of the disease to the United States.[10]

The Mexican government also consulted repre-

[6] *Ibid.*, 19–22, 26, 29, 324, 374; 1949, p. 83; 1951, pp. 151–152. See also U. S. Department of Agriculture, Agricultural Research Administration, Bureau of Animal Industry, "Summary of Developments in the Mexican Outbreak of Foot-and-Mouth Disease," January 28, 1947, pp. 3–5 (hereinafter cited as U. S. D. A., "Report"). I wish to thank Mr. Claude A. Smith, Acting in Charge, Inspection and Quarantine Division, United States Department of Agriculture, for mimeographed copies of reports on developments in the campaign against the disease. Preparation of these reports began in January, 1947, and continued periodically until the end of the program. They have been valuable in the preparation of this study and are to be found in printed form in the California Senate *Reports*. An account of the lengthy diplomatic negotiations between Brazil and Mexico concerning the importation of these bulls, sometimes referred to as the "Battle of the Brahmas," is in California Senate, *Report*, 1951, pp. 98–199.

[7] *Ibid.*, 1947, p. 29.

[8] The border patrol was to prevent illegal entry of animals or products likely to carry the infection from Mexico to the United States. The border, nearly 2000 miles long, runs through extensive areas of range land where domestic and wild animals could enter the United States. Some 600 able rangers, using horses and jeeps, worked out of camps from fifteen to twenty miles apart. There was close cooperation between rangers and customs and immigration officials in the enforcement of regulations. Rangers worked in two seven-hour shifts daily; at critical points they worked "around the clock." The border patrol uncovered numerous attempts to smuggle animals into the United States. Such animals were killed and buried or burned. American tourists attempted to bring illegal articles in their baggage; for instance, several tourists had bloody spears used in Mexican bullfights. Rangers and immigration officials confiscated such things, and warned tourists of the danger to livestock in the United States. See California Senate, *Report*, 1949, pp. 26, 33, 38, 42, 46, 50–51, 69, 70–71, 72, 83, 133; 1951, pp. 41, 75.

[9] U. S. D. A., "Report," January 28, 1947, pp. 2–3.

[10] *Ibid.*, 5, 8.

sentatives of Argentina, Brazil, Chile, and several European countries. On January 3, 1947, Nazario S. Ortiz Garza, Secretary of Agriculture and Stock Raising, conferred with other interested officials in an effort to work out a system of control. As a first step, quarantine lines were established around the infected zone. The lines were to be patrolled by units of the Mexican Army.[11]

On February 28, 1947, President Harry S. Truman signed a bill to aid Mexico in suppressing the outbreak of foot-and-mouth disease. On March 5 and 6, several officials of both governments, including Licenciado Flores and Dr. Camargo, met in Washington to discuss plans. They resolved to establish a joint office in Mexico City as soon as possible to be administered by a director, named by the Mexican Secretary of Agriculture and Stock Raising, and a co-director, named by the U. S. Secretary of Agriculture. The directors were in turn to be responsible to a joint administrative board of six members. The board would appoint "an advisory committee consisting of such persons as may be desired."[12] Thus the Mexican-American Commission for the Eradication of Foot-and-Mouth Disease was created.

The Mexican appointee, as director, was Licenciado Flores; the United States appointee, as co-director, was Dr. Maurice S. Shahan, an able research scientist and veterinarian who had long been connected with the Bureau of Animal Industry. In May 1948, Dr. Shahan was succeeded by General Harry H. Johnson whose administrative experience during World War II stood him in good stead as co-director of the program. Shahan was then selected by the Bureau of Animal Industry to plan and direct an extensive foot-and-mouth disease research program already authorized by Congress. The mixed Commission consisted of three American and three Mexican experts who were to "determine operating policies and procedures in the foot-and-mouth disease campaign."[13]

By May 1947, the mixed Commission had agreed on all major policies and methods of conducting field operations. They solicited aid of technical advisers on personnel, equipment, finance, legal matters, and public relations. Major policies governing the campaign at the outset included: (1) concentration of effort on outlying centers of infection; (2) use only of "the time-tested methods of quarantine and slaughter that have fully demonstrated their effectiveness"; (3) appraisal of, and compensation for, condemned animals and other property; (4) replacement of work oxen with mules or tractors; and (5) agreement to permit representatives of Mexican stockmen's associations and fighting-bull interests to serve as consultants in the appraisal of condemned stock.[14]

The Commission utilized personnel from both countries. Mexico offered enough troops to maintain quarantine lines and accompany inspection teams. The Department of Agriculture sent several experienced veterinarians aided by capable younger experts. Both countries furnished sanitary technicians, appraisers, paymasters, and livestock inspectors. By February 1949, at the peak of the program, Commission personnel numbered some 3700, excluding units of the Mexican Army.[15]

Equipment was supplied largely by the United States. Early in the campaign, several carloads of power-digging equipment, vehicles, and other supplies were sent to Mexico. By the end of August 1947, 700 pieces of heavy equipment had been sent, and orders had been placed for 900 additional items, including jeeps, light trucks, tractor units for semi-trailers, semi-trailers for heavy equipment, 250-gallon tank trailers, bulldozers, scrapers, mobile repair shops, L.C.M. boats (landing craft), and open boats with outboard motors. With thousands of premises to visit, and great numbers of animals to inspect, rapid means of transportation were essential. The jeep was indispensable under adverse travel conditions and over rough terrain. The Commission's engineers

[11] Manuel M. Moreno y José Angel Aguilar, eds., *La Fiebre Aftosa en México* (Departmento de Información, Mexico, D. F., 1951), 12, 15, 20–21.

[12] U. S. D. A., "Report," March 11, 1947, pp. 2–3.

[13] California Senate, *Report*, 1949, p. 130; U. S. D. A., "Report," August 9, 1948, p. 2. The three United States members of the joint Commission were Dr. B. T. Simms, Chief of the Bureau of Animal Industry; N. E. Dodd, Undersecretary of Agriculture; and Dan Stoops, Assistant Agricultural Attaché, United States Embassy, Mexico City. The three Mexican members were Dr. José Figueroa, Dr. Frederico Rubio Lozano, and Ignacio de la Torre, all of the Ministry of Agriculture and Livestock Industry. See U. S. D. A., "Report," April 10, 1947, pp. 3–4.

[14] *Ibid.*, May 17, 1947, pp. 3–4.

[15] *Ibid.*, April 10, 1947, p. 5; May 17, 1947, p. 4; July 23, 1947, pp. 3–4; August 4, 1947, pp. 5–6; California Senate, *Report*, 1949, p. 146.

even constructed "jeep trails" and "truck trails" into remote areas.[16]

Both governments provided funds to cover the cost of the eradication program. In March 1947, the United States made available $9,000,000 as its share of expenses up to June 30, 1947. On October 3 the two governments entered into a fund-pooling agreement to accelerate the campaign. Mexico agreed to contribute 3,000,000 pesos monthly to the Commission's account; the United States would "contribute additional sums necessary for the swiftest possible operation of the program." Prior to October 3, the United States paid for all cattle indemnities, and Mexico paid for condemned swine, sheep, and goats. Both governments agreed on prompt liquidation of outstanding debts incurred prior to creation of the joint fund.[17]

From the start of the campaign through November 1947, the Commission held that the most effective methods of eradication were quarantine, slaughter, burial, and disinfection. But in some areas some stockmen opposed this system; they were unwilling to sacrifice their animals or to accept the indemnity offered. To overcome this opposition, and in response to a request from the Commission, President Miguel Alemán issued a decree providing for compulsory, immediate slaughter of all infected or exposed animals, effective September 22, 1947.[18] This early phase of the campaign merits brief examination.

Quarantine lines, maintained by Mexican troops, were established around the entire infected zone. Moreover, a barbed-wire fence was constructed on the eastern portion of the northern quarantine line from a point below the town of Tamiahua on the Gulf Coast to Tamazunchale in the State of Vera Cruz, a distance of some ninety miles. Gates at natural points of travel were guarded by soldiers and sanitary technicians, who enforced rules prohibiting the movement of animals and animal products from infected to clean areas, and administered disinfection procedures. By March 1948, other control measures included: (1) the establishment of buffer zones just inside the quarantine lines, with repeated inspections of susceptible animals in such zones; (2) vaccination of cloven-footed animals in buffer zones, especially near infected areas; and (3) slaughter and burial of all sick and exposed animals. The width of these zones varied, depending on topography and protective needs; in general, each was fifteen to twenty miles wide. Most personnel and equipment, of course, were concentrated in buffer zones.[19]

To "get ahead" of the disease, infected animals were slaughtered immediately after the infection was discovered, covered with lime, and buried *en masse* in deep ditches dug by power equipment. Animals which had mingled with those infected and even those on adjoining premises were also slaughtered and buried.[20]

This extensive slaughter program followed by the Commission caused much difficulty. The Mexican peasants lived on small plots eking out an existence by raising corn, beans, and other crops. The ox-drawn wooden plow was the chief means of tillage. Most peasants possessed a few other animals—cows, goats, pigs, and poultry—on which they depended for subsistence. They treasured their cattle. It was not unusual to see women in mourning, accompanied by their husbands, standing beside the grave of slaughtered animals—bereft "as if they were attending the funeral of some member of the family."[21] The overwhelming majority of them have never had an opportunity to attend school, and the rate of illiteracy is very high. They are not only ignorant, but also suspicious of outsiders.

Sanitary technicians moved into infected areas on the heels of slaughter crews, obtained necessary labor from local sources, and began the all-important disinfection of infected ranch premises, animals, implements, vehicles or any other possible carriers. Equipment from the United States was very valuable to the crews. Tank trucks hauled water, frequently many miles, to points where local water supplies were exhausted. Pressure sprayers were used to apply the soda-ash or caustic-soda disinfectants. Other smaller items such as rubber equipment, sponges, scrapers, brooms, and machetes were used. Disinfection crews did everything possible to conserve farm property; haystacks, for example, instead of being burned, were carefully trimmed to remove parts on which sick animals had fed, and were then sprayed with a suitable disinfectant.[22]

[16] U. S. D. A., "Report," May 17, 1947, p. 1; August 30, 1947, p. 3; May 10, 1948, pp. 8–9.
[17] *Ibid.*, April 10, 1947, p. 4; November 7, 1947, p. 2.
[18] *Ibid.*, September 30, 1947, p. 2.
[19] *Ibid.*, March 18, 1948, pp. 4–6.
[20] California Senate, *Report*, 1949, p. 7.
[21] Moreno y Aguilar, *La Fiebre Aftosa en México*, 29.
[22] U. S. D. A., "Report," August 4, 1947, p. 6.

These operations tended to prevent spread of the disease. It has been estimated that, during an average month in the summer of 1948, the program involved 1,900 planes, 4,500 railroad cars, 2,500 livestock trucks, and 1,600 boats and barges. Further, some 7,000 migrant workers (*braceros*), who worked seasonally on American farms and ranches, together with their baggage and other personal effects, were thoroughly inspected and disinfected.[23]

By May 1948, some 200 disinfection stations had been established to help protect the quarantine lines.[24] Individuals passing these stations had to disinfect their shoes by standing in sawdust pits containing a powerful disinfectant; and had to show that they were not carrying anything that might carry the virus.

After slaughter and disinfection in a given area, the next step was to test the infectivity of the premises. Thirty days after the date disinfection was completed, a few susceptible animals—generally pigs and calves—were placed on the premises and frequently inspected. If they showed no symptoms within ninety days, further restocking took place gradually.[25]

These methods of eradication continued until late 1947. From the beginning it was obvious that they would severely strain the economy of Mexico since more than a million cattle and as many small animals might be destroyed. Nevertheless, Mexican authorities believed that the government and people could mobilize for a quick campaign and withstand the economic strain. Early in August 1947, however, the government was besieged with requests from stockmen, stockmen's associations, and public officials in the infected area who had lost hope for success by the slaughter method and proposed a change to an extensive vaccination program. This proposal was rejected on the grounds that use of vaccines would impede the slaughter method by which, many still hoped, the disease could be eradicated.

Despite such hopes, the slaughter program proved prohibitive. The disease kept spreading. It was impossible to stop unauthorized movements of susceptible animals and other carriers of the virus. Troops at times were lax in enforcing the quarantine; many of the people, characteristically enough, did not take regulations very seriously. The work of eradication, however, was intensified, and personnel were regrouped in the hope of hemming in new areas of infection within main quarantine lines. Slaughter of animals proceeded at the rapid rate of 58,000 weekly during the summer and early fall of 1947, totaling by November nearly 500,000 cattle, and almost as many small animals. In the light of these developments, and under increasing pressure from stockmen, representatives of both governments attempted to foresee the ultimate scope of the slaughter program. It was clear that such a program, if continued to a successful conclusion, would mean destruction of most of the susceptible animals in the entire area under quarantine; estimates ran to 5,000,000 cattle and as many small animals. Mexican officials notified the Commission that the country could not stand the economic shock of such wholesale destruction, and proposed a change in the program—to an extensive vaccination campaign.[26]

Accordingly, late in November 1947, the Commission made the most significant decision of the entire campaign. In a sharp reversal of policy, it changed from a program of almost unrestricted slaughter to one of vaccination. Under the new plan quarantines, inspections, and disinfections continued; sick and exposed animals were slaughtered; and all healthy ones were vaccinated to build up their resistance. Starting along main quarantine lines on the north and south, vaccination crews worked toward the interior and thus gradually reduced the size of the infected area.[27] This second phase of the campaign should be examined in some detail.

The infected area was divided into nine districts, each in charge of two veterinarians, one Mexican and one American, trained in administrative procedure by General Johnson. These men directed the several activities of vaccination crews. First, propaganda men went into rural areas and informed stockmen of the necessity of vaccination and eradication. Next came "line-up" men to advise stockmen that vaccinators would arrive on a certain day, and that animals should then be rounded up to save time. Next came technicians to vaccinate the animals. Lastly, inspectors came

[23] *Ibid.*, August 9, 1948, p. 4.

[24] *Ibid.*, February 7, 1949, p. 6; California Senate, *Report*, 1949, p. 64.

[25] California Senate, *Report*, 1947, p. 191; 1949, p. 64.

[26] U. S. D. A., "Report," December 26, 1947, p. 2–3; California Senate, *Report*, 1949, p. 8.

[27] California Senate, *Report*, 1947, p. 427; 1949, pp. 85–86, 130.

to observe the effect of the new method and to vaccinate any animals which had been overlooked. When a crew reached a certain destination, it divided. Half returned to the starting point, recruited additional help, and traversed the same territory to vaccinate the animals a second time. The other half recruited additional help, proceeded to another predetermined point, and, on reaching that goal the same process was repeated. Personnel in all nine districts were provided two-way radios. Each district had a central radio station and substations, with which it was possible to communicate with headquarters in Mexico City and with men on field duty. Thus, four vaccinations of susceptible animals in the infected area were completed, each progressively decreasing the number of outbreaks. After the fourth vaccination no fresh cases of foot-and-mouth disease appeared.[28] The new program proved successful.

At the outset, supplies of the needed serum in Mexico were inadequate. Mexican scientists, aided by a Brazilian and three Argentine researchers, immediately began production of serum on a small scale at San Jacinto, in the Federal District. This vaccine, first used on February 20, 1947, proved satisfactory, but much more was needed. The United States offered all possible technical assistance, and the Mexican government named a consultant board of five eminent Mexican scientists to supervise research and large scale production. An elaborate plant was established at Palo Alto, not far from Mexico City; called the "Institute for the Elaboration of Vaccine and Investigation of Aftosa Fever," it was modern in every respect, and adequate to meet Mexico's needs.[29]

Meanwhile the Commission obtained serum from Argentina, Denmark, the Netherlands, and Switzerland, totaling nearly 1,645,000 doses, while production in Mexico was beginning. This vaccine cost as much as one dollar per dose.[30]

Vaccine production in Mexico rapidly increased. This vaccine "had an operating advantage over the previous importations from Europe," because each dose was greatly reduced in size: imported vaccines were in fifteen-cubic-centimeter and thirty-cubic-centimeter dosages; the Mexican type was highly concentrated to a two-cubic-centimeter dose for cattle and a one-cubic-centimeter dose for small animals. Such concentration facilitated refrigeration and handling of the vaccine. Possibly this is one reason why the Mexican vaccine produced such strong initial resistance to the disease, as was shown by tests taken two weeks after vaccination.[31]

On April 13, 1950, the last vaccine was produced in Mexico, totaling 53,124,000 units. After the campaign ended, a reserve supply of 7,500,000 doses was kept for possible emergency. Mass production greatly reduced the cost; it was estimated in November 1949, that the cost to the United States for the entire campaign in Mexico would be 45 cents per animal vaccinated.[32]

To make sure that vaccine reached the field with its effectiveness undiminished, the Commission obtained refrigeration facilities which kept it constantly at the proper low temperature. Vaccines were tested before being released for use. Tests, lasting over a period of 45 days, were of two types: "safety" tests to make certain the vaccine would not cause the disease; and tests to determine the degree of protection. In the latter test, animals were inoculated, allowed ample time to become immune, and then exposed to the virus. The period of protection by vaccine is approximately six months.[33]

Three types of virus, designated as A, C, and O, are known to cause foot-and-mouth disease. Types A and O appear most frequently in outbreaks in western Europe; type C occurs frequently in the Mediterranean area. All three are present in South America. Only type A was identified in Mexico from the start of the campaign to October 1949. Thus, the vaccine for type A, obtained early in the program from Denmark, Holland, and Switzerland, proved satisfactory. In October 1949, type O virus appeared in Chicoloapan, State of Mexico. The Commission was unable to ascertain how this type was introduced. Immunity from each type of virus calls for a different vaccine. The Commission anticipated the appearance of types other than A, and was fully prepared to prevent spread of such infection.

[28] *Ibid.*, 1949, pp. 10, 94–95; 1951, p. 35.

[29] *Ibid.*, 1947, pp. 44–45; Moreno y Aguilar, *La Fiebre Aftosa en México*, 36, 38–39.

[30] U. S. D. A., "Report," March 18, 1948, pp. 8–9; August 9, 1948, pp. 3–4; December 10, 1949, p. 1; California Senate, *Report*, 1949, p. 92; 1951, p. 9.

[31] U. S. D. A., "Report," May 12, 1949, p. 4; California Senate, *Report*, 1949, pp. 44, 131–132.

[32] U. S. D. A., "Report," July 5, 1950, p. 2; California Senate, *Report*, 1951, pp. 9, 66, 82.

[33] U. S. D. A., "Report," May 10, 1948, pp. 4, 6–7; California Senate, *Report*, 1949, p. 132.

In keeping with established practice, the 269 animals infected with type O virus were promptly slaughtered; the premises were cleaned, disinfected, and placed under quarantine. Within a month susceptible "test" animals were brought to the grounds and kept there for ninety days. These animals did not take the disease, and the quarantine was lifted on February 14, 1950.[34]

During both phases of the campaign—slaughter and vaccination—many obstacles had to be surmounted. To overcome peasant resistance the Commission launched an extensive propaganda campaign designed to inform peasants of the seriousness of foot-and-mouth disease and to explain the need to slaughter all infected animals. Early in July 1947, Mexican authorities sent twelve trucks carrying speakers, record players, and public address systems to centers where the eradication program was under way. Some one hundred broadcast records were made and sent to 250 Mexican radio stations. These records explained the danger of the disease and the need for slaughtering infected animals. The Mexican Ministry of Education prepared a series of posters to be put in public places throughout the infected area. One described symptoms of the disease, and listed precautions to be taken if animals became infected. Another had a large picture of the widely known patriot, Vicente Guerrero; it implied that as Guerrero had aided in the war of liberation of Mexico from Spain, so must all countrymen do their patriotic duty and join in the new fight. Still another aid was a motion picture film about the disease and the benefits that would come to all Mexicans from its complete eradication.[35]

The Ministry of Education sent to all rural school teachers a printed booklet on the program. Teachers were asked to disseminate information in their respective communities. In August 1948, a periodical titled *Saber* (To Know) began publication; it contained cultural, historical, and literary items, interspersed with accounts of the disease.[36] In February 1949, the Commission placed on the payroll a number of information men (*informadores*) and influential citizens such as teachers and municipal officials to aid in the propaganda campaign.[37]

Opposition stemmed from sources other than peasants. Along with some political extremists, a number of unscrupulous cattle buyers spread rumors that vaccination would either kill the animals or make them sterile. One duty of informadores was to counteract such misinformation.[38]

Despite all efforts of the information services, there was both passive and active resistance; at times open violence flared up. For instance, on September 1, 1947, a Mexican veterinarian employed by the Commission, and six soldiers, were killed by a mob in the State of Michoacán. The mob was organized and incited to violence by political extremists. On March 26, 1948, Juan H. López, a United States livestock inspector, was shot while on a mission to explain to stockmen measures for suppressing the disease; he died from his wounds the next day. On January 31, 1949, a mob estimated at 700 persons attacked a livestock inspection crew in the village of Temascalcingo, State of Mexico. Robert L. Proctor, a livestock inspector from Tucson, Arizona, was killed in the attack. The Mexican inspector was severely beaten and left unconscious. After Proctor's murder active resistance declined considerably. But there continued to be much passive resistance.[39]

The education program, together with the compensation of stockmen for all condemned animals, eventually brought about fuller cooperation on the part of stockmen. Fair appraisals and prompt payment of indemnities for animals slaughtered created more favorable sentiment among the people. Veterinarians determined which animals should be killed. A just evaluation was placed upon them by a Mexican and an American after consulting the owner of the animals. The average valuation of cattle was $50 per head; oxen averaged $76 per head; small animals (swine, sheep, and goats), $12 per head. The indemnity

[34] U. S. D. A., "Report," May 12, 1949, p. 4; March 20, 1950, p. 4; California Senate, *Report*, 1951, p. 8.

[35] U. S. D. A., "Report," August 4, 1947, pp. 7–8; Moreno y Aguilar, *La Fiebre Aftosa en México*, 30–33.

[36] U. S. D. A., "Report," August 4, 1947, p. 8; October 20, 1948, p. 6.

[37] *Ibid.*, February 7, 1949, p. 5.

[38] *Ibid.*, September 30, 1947, p. 3; May 12, 1949, p. 3; California Senate, *Report*, 1947, p. 418.

[39] U. S. D. A., "Report," September 30, 1947, p. 3; May 10, 1948, p. 5; February 7, 1949, p. 5; May 12, 1949, pp. 2–3.

policy carried over into the vaccination phase of the campaign.[40]

The peasants at first were relucant to give up their oxen. When assured, however, that their oxen would be replaced by mules, the peasants no longer hid oxen in the hills where they would be potential sources of reinfection. Under the "mule-for-oxen" program, mules were obtained mainly in the northern Mexican states, and were made available to those whose oxen were condemned. Many purchased mules with the money received from sacrificed oxen. This money did not cover the full cost of mules, but the Mexican National Commission absorbed the difference. In all, some 29,300 oxen were replaced with mules. Necessary harness, largely hand-made, was also procured. Steel plows replaced many old wooden ones. Some farmers preferred garden tractors to mules; and 287 such tractors, some of the rototiller type, were made available. Moreover, the use of mules and steel plows resulted in increased farm productivity.[41]

Most stockmen cooperated in the vaccination program. Some, however, resisted it because they feared the serum might somehow cause the disease; others questioned its value, because the United States had not used that method in past outbreaks. The Commission, through its educational program, was able largely to overcome such resistance.[42]

After the disease broke out, importation of meat, as well as livestock, from Mexico into the United States was prohibited. This brought great economic pressure on stockmen in northern Mexico, because they could not find a market for their livestock. In response to this, the U. S. Department of Agriculture sponsored a canned meat program in that area. In March 1948, the Department signed contracts with six packing companies for the purchase of canned meat, at 28 cents per pound; by-products such as hearts, liver, and tripe came at 18 cents per pound. Several new packing plants were established to provide additional facilities for this program. Meat from healthy animals only was canned. The aim was to resell it, largely for European relief purposes; much was sold to the United Kingdom, Italy, Austria, Trieste, the International Refugee Organization, and the National Catholic Welfare group; some was sold to the United States Army for use in occupied areas of Europe. By March 1950, 218,000,000 pounds of canned meat had been purchased, and 150,000,000 pounds had been resold. A larger market was found in December 1950, when the embargo preventing sale of this canned meat in the United States was lifted.[43]

Packing plants were operated on a cooperative basis by interested cattlemen, under arrangements by which they received the full profit from their animals. Late in 1948, certain purchases of animals for canning plants threatened to cause a break in the northern quarantine line. To correct this, operators of all plants having contracts were notified to confine purchases to the states in north Mexico, which, before the outbreak of the epidemic, had large export quotas for shipment to the United States.[44]

In conclusion, the decision to use vaccine was clearly a wise one. Working from the outside of the infected zone toward the center, vaccination teams had applied some 60,000,000 injections, in four different vaccinations, by the end of August 1950. The infected zone rapidly decreased to nothingness, in the world's outstanding campaign of its kind.[45]

Results were excellent. By the spring of 1951 foot-and-mouth disease had been wiped out in Mexico. Steps were taken to restock the afflicted areas. Artificial insemination was deemed the best procedure in compensating for losses of livestock. Hence the Institute of Artificial Insemination was established at Palo Alto, where vaccine had been produced in large quantities. Mexico imported choice animals to be utilized for this purpose. The United States promised to co-

[40] *Ibid.*, July 23, 1947, p. 4; August 4, 1947, p. 3; March 18, 1948, p. 6.

[41] *Ibid.*, August 4, 1947, p. 5; May 17, 1947, p. 2; Moreno y Aguilar, *La Fiebre Aftosa en México*, 32–33.

[42] U. S. D. A., "Report," March 18, 1948, p. 8; May 10, 1948, p. 7.

[43] *Ibid.*, March 18, 1948, pp. 6–7; October 20, 1948, p. 3; February 7, 1949, pp. 8–9; March 20, 1950, p. 3; California Senate, *Report*, 1949, pp. 46, 133; 1951, p. 9.

[44] U. S. D. A., "Report," February 7, 1949, pp. 8–10; California Senate, *Report*, 1949, p. 133.

[45] Moreno y Aguilar, *La Fiebre Aftosa en México*, 39, 58. A series of excellent maps showing how rapidly the infected area decreased in size until the disease was blotted out are shown, *ibid.*, 59–68. California Senate, *Report*, 1951, p. 93.

operate fully in rehabilitation of Mexico's herds and flocks.[46]

The project to eradicate foot-and-mouth disease was closed in August 1952. All United States personnel connected with it, except twenty-two veterinarians, left Mexico. Those veterinarians, stationed one in each of twenty-two state capitals, were to aid Mexican inspectors in keeping on the lookout for any new outbreaks.[47] The mixed Commission was abolished. On September 1, 1952, Charles F. Brannan, United States Secretary of Agriculture, announced that Mexico was free of foot-and-mouth disease, and lifted the embargo which had been in force for nearly six years on imports of livestock and fresh meat coming from Mexico into the United States.[48]

[46] Moreno y Aguilar, *La Fiebre Aftosa en México*, 69–71, 77; *La Prensa* (Mexico, D. F.), September 2, 1952, p. 2.

[47] I am indebted to Mr. Glenn H. Boyd of Los Angeles, California, who was General Superintendent of Shops in San Jacinto, for this information. In a conversation early in September, 1952, he told me he was contemplating the acceptance of a similar assignment in Chile where foot-and-mouth disease had broken out. See also *La Prensa* (Mexico, D. F.), September 2, 1952, pp. 2, 30.

[48] *Ibid.*, 2.

BOOK REVIEWS

Ackerbau und Viehhaltung im Vorindustriellen Deutschland. By FRIEDRICH KARL RIEMANN. (Beihefte zum Jahrbuch der Albertus Universität zu Königsberg, Prussia, III. Holzner-Verlag, Kitzingen am Main, 1953, vi, 211 p.).

This appears to be a carefully prepared history of crop and livestock production and farming in Germany, covering the period from 1650 to 1850. It also gives a few facts about the period since the end of the Middle Ages and as late as 1935. The physical, economic, and legal conditions prevailing in various areas of Germany during this period are given in detail and their influences are considered in explaining the changes that have occurred in farming.

The Thirty Year's War (1618–48) had reduced the population by about 35 per cent. Property damage was also heavy and about 100 years passed before complete recovery occurred. During this period the crops grown comprised mainly rye, barley, oats, and wheat. Fallow land, in the areas shown, made up 20 to 25 per cent of the area and miscellaneous crops such as legumes, hoe crops, oil crops, and forage made up 5 to 10 per cent.

Livestock production was largely independent of the crops mentioned, depending more on natural pastures. Enough of the surplus pasture crop was usually stored to keep the cattle and sheep from starving during the winter. The term "schwanz vieh" (tail livestock) used in the literature of the times referred to the animals that were so weak in the spring that they had to be pulled out of their stalls. Plenty of land was available at this time. Labor was in limited supply and needed to be conserved. Keeping livestock under these conditions enabled the people to supply much of their food and clothing needs with a minimum of labor. Consumption of meat per capita in Germany, even at the end of the Middle Ages, was more than 100 kilograms per year.

Scattered production data indicate about 1,000 liters of milk per cow, and live weights of 500 pounds for cows and 700 pounds for steers. Cattle were not generally marketed before four years of age; hogs often at about two years. Many of the hogs lived largely in the woods on beechnuts and acorns. Wool production averaged about two pounds per ewe and four pounds per wether.

By about 1750 population had increased to a point where more farm products were needed than ever before. Livestock came to be regarded as an aid in increasing crop yields. However, experience taught that the value of manure was low if animals were poorly fed. Some shift from fattening oxen to dairying occurred especially in northwest Germany where hay crops had a high comparative advantage. Potatoes and vegetable crops aided greatly in supplying food and replaced some of the fallow land. Clover was now seeded in the last small grain crop in the rotation and produced a full crop the next year. Besides west Germany, clover penetrated more and more through middle Germany. The proportion of grass to tillage (tilled land) grew in north Holstein to 1:1, in east Holstein to 1:1.5, in Mecklenburg 1:2–3.

During the late 18th and early 19th centuries, considerable livestock improvement occurred; first with sheep, later with cattle and hogs. Generally the most success resulted from the use of well bred males on the native female stock. Better feeding was a necessary factor in improving the livestock and livestock production. More industralization, higher prices for farm products, and the use of commercial fertilizers resulted in greater crop and livestock production to meet the needs of an expanding population.

Emil Rauchenstein, U. S. Department of Agriculture, University of Wisconsin.

South African Food and Agriculture in World War II. By J. M. TINLEY. (Studies on Food, Agriculture, and World War II, published by Food Research Institute. Stanford, Stanford University Press, 1954, xii, 138 p., $5.00).

This monograph by a former South African will interest both the agricultural and the social and political historian. The author by careful interpretation of statistical data shows how World War II forced a reorientation of South African export markets by its closing off normal Central European outlets. The British government came to the rescue with guaranteed purchases of large quantities of basic South African exports, chiefly wool, meat, and fruit. Although the author does not say so this British policy was dictated by the necessity of keeping the Smuts pro-war government in power. Simultaneously the boom in war industries attracted many to urban areas and raised their living standards so that for the first time South African farmers had a rather large domestic market.

Traditionally paternalistic toward agriculture, the Union government intensified this policy during the war so that agricultural producers enjoyed a boom. The effect, however, upon the South African consumer was less happy. Urban wage levels kept pace with commodity prices, but by 1945 guaranteed export markets and consumer ability to pay high prices had created a shortage of basic foodstuffs in urban areas. The apparently obvious remedies of rationing and price-controls the government was loath to apply for political reasons, instead preferring to increase subsidies to farmers in the hope that retail prices would decline. When this proved a vain wish, the government called in British experts whose recommendations of the very things the government had hesitated to adopt during the war were dismaying to contemplate in peacetime.

Although perhaps the writer did not have the duty, it might have been desirable for him to have related South African agriculture in wartime to wider recent Union history. The book shows clearly the reasons for the present heavy European urban concentration. It is plain from the work that the smashing Smuts victory of 1943 was against a background of satisfied urban Europeans and prosperous farmers, while the material in the monograph permits the deduction that urban resentment at post-war food shortages and rural fears of rationing-price control contributed to the narrow victory of the Nationalist-Afrikaner Party alliance in 1948.

Colin Rhys Lovell, University of Southern California.

Anglo-American Law on the Frontier. By WILLIAM BASKERVILLE HAMILTON. (Durham, North Carolina, Duke University Press, 1953, x, 498 p., $12.50).

This book is in three parts. The first is a brief and entertaining biography of Thomas Rodney, young brother of Caesar Rodney of Delaware, who always overshadowed him. Thomas was an ardent revolutionary. He led troops, acted as a merchant, as member of Congress, as admiralty judge, and as a purchasing agent during the war. But by 1791 he was jailed for debt. For ten years thereafter, he wrote much to claim that his role in the Revolution was a key one. He was also visited by the ghosts of worthies such as Julius Caesar. His son became an important man in the Jeffersonian party and in 1803 Thomas Jefferson appointed Rodney as a judge and as a land commissioner of Mississippi Territory. From 1803 to his death in 1811, Rodney's career was remarkable and he won the hearty support of the people of the territory.

The second part of the book deals with the relationship between territorial courts and federal courts, and with the development of the law in Mississippi Territory. Professor Hamilton bluntly and correctly states that the territories were "colonies" of the United States. Mississippi Territory was as complicated a tangle as could be found among the American "colonies." It had been occupied by the Spanish, the British, the Spanish again, and by the United States. The state of Georgia claimed it as a part of Bourbon County. All these governments made conflicting land grants. And at one time or another, English, Spanish, and American law applied to these and all other matters in the area.

Thus, Judge Thomas Rodney and the other judges were faced with problems that would have defied a very Solomon. Judge Rodney's notes on judicial cases from 1804–1809 make up the third part of the book. The editor has done a prodigious job of transcription and annotation. It is little wonder that the judge kept notes, considering the bewildering variety of cases that came before him, and the almost hopeless question of what law, if any, applied. This book is an invaluable addition to the history and law of the territories of the United States.

Merrill Jensen, University of Wisconsin.

The Nebraska Question: 1852–1854. By JAMES C. MALIN. (Lawrence, Kansas, The Author, 1541 University Drive, 1953, ix, 455 p., $4.00).

James C. Malin's writings are all distinguished for resourceful investigation, fresh thinking, and radically new perspectives. Accepted historical stereotypes based on limited knowledge and faulty thinking challenge and arouse his critical faculties. To his investigations he brings not only originality but a remarkable versatility that makes the history he writes truly cultural in that it synthesizes geography, technology, politics, economics, values, and time perspectives.

In his latest work Malin takes a second look at the onset of the crisis produced by the failure of political leaders to resolve in 1850 the wholly new situation created by a striking concatenation of major developments. The annexation of Texas, the settlement of the Oregon question, and the cession of California and the

southwest put the geographic center of the United States in that country west of the Missouri River that an earlier generation had dedicated to the perpetual occupancy of Indian tribes. By 1850 acquaintance had devastated the concept of the area as a "Great American Desert" fit only for Indian exiles. Simultaneously the perfection of steam transportation accomplished a technological revolution to which public policy had to adjust. It made possible not only occupancy of the interior but communication with the west coast. In the same decade the increased flow of immigration supported the expansion of the American economy and stimulated the growth of nativism.

For Missouri the changed situation was pregnant with meaning. Penetrating the dust thrown by politicians battling for control of the state Democratic machine, Malin finds evidence of considerable insight at folk level into the basic reorientation. A railroad could and would be laid to connect the Pacific and the Mississippi. Through the eastern terminus would flow the commerce of the Orient and of the west coast. At the eastern portal industry would develop. It was imperative that Missouri snatch the prize from Chicago, Memphis, and New Orleans. To make the scheme viable it was essential to find a pass through the Rockies that would point towards northwest Missouri, and to find a formula agreeable to the south for organizing the Indian country for white settlement. It was generally believed that the economic outlook for slavery in the new territory was dubious; probable patterns of agricultural organization subordinated slave status to the railroad fever. The only real "slavery" issue was whether Kansas would welcome free Negroes and attract fugitive slaves from Missouri.

Until recently historians have interpreted the evidence relating to the Kansas-Nebraska question largely in terms of the slavery conflict. Under the light of new research that cliché fades. Malin has shown in another work that the contest for timbered bottomlands was a substantial element in Kansas anarchy. In the present work he presents further evidence to support the once novel thesis that the Douglas formula for splitting the country north of the Cherokee nation into two territories stems from railroad promotion rather than from a conspiracy of slave-owners and ambitious politicians. He shows that the idea was current in Iowa and Missouri before Douglas introduced it, and studies intensively the shifting attitudes as seen in the press of northwestern Missouri.

Malin does not profess to have settled the numerous and complex questions to which historians have addressed themselves, but only to have reopened the argument by presenting new data and new perspectives. In a review it is possible neither to summarize the evidence nor to do justice to the varied insights that flow from Malin's forty years of preoccupation with the problem.

Thomas LeDuc, Oberlin College.

Arid Domain: The Santa Fe Railway and its Western Land Grant. By WILLIAM S. GREEVER. (Stanford, Stanford University Press, 1954, x, 184 p., $4.00).

It is unfortunate that writers must cut their manuscripts to fit the Procrustean bed of rising costs of printing. A particularly unhappy result occurs when a historian in dealing with a subject about which little is known must compress his findings based upon the use of a mass of excellent source material into a thin booklet. The author of *Arid Domain* apparently confronted this problem. In the preface he states that the printed version is intended "for the curious layman and the average historian" and refers "The relatively few experts who will wish complete, minute details . . . to the thesis deposited in the Harvard College Library . . . ." In spite of improved communication facilities the availability of a typescript copy is not an adequate *quid pro quo* for a more complete published version.

In scarcely more than one hundred and fifty pages of text Professor Greever traces many facets of the railway land grant problem from 1866 to 1946. In spite of the brevity of the book some attention is paid to the Indians of Arizona and New Mexico, to the sheep and cattle industries, to the intricate processes of railroad organization and reorganization which by 1897 had put the Santa Fe in possession of lands originally granted to the Atlantic and Pacific Railroad, and to the land disposal policies of the first proprietor of the *Arid Domain*. The principal portion of the book, chapters V through XI, deals with the efforts of the Santa Fe Pacific Railroad to consolidate the alternate sections into solid holdings and to devise profitable procedures. The lieu-land device seems to have been used most consistently. This permitted the railroad to select vacant public lands in lieu of granted lands that were within the limits of Indian reservations or forest reserves. The land scrip which resulted from the lieu-land exchanges was sold in large quantities by the railroad to dealers in land. The author describes in as much detail as possible the process as well as the result of the exchanges which involved a large fraction of the total grant. To complete the story some attention is given to outright sales and to leases for grazing purposes and oil development.

Although a mountain of data has been compressed into a few pages the book is readable, some individuals such as Howel Jones, first land commissioner of the Santa Fe Pacific, and Hugo Seaberg, a scrip dealer of Raton, emerge from the background, and the general pattern of development is clear. Several maps, a number of helpful appendixes, an adequate index, and an excellent bibliography contribute to the usefulness of the volume. The feature that should attract the attention of every historian who is interested in railroads and the public lands, is the fact that the book is based primarily upon manuscript records that are now in the possession of the Santa Fe Railway Company. Pro-

fessor Greever has conferred an important benefit upon the historical profession by making judicious use of materials that may be opened to other students of land and railway problems. Some of these may be stimulated into activity by the following sentence from the closing paragraph, "This study reveals that, with a few minor exceptions, the Santa Fe Pacific conducted its business with strict honesty, showing due consideration for the welfare of the public in general."

George L. Anderson, University of Kansas.

Management of Agriculture and Food in the German-Occupied and Other Areas of Fortress Europe, A Study in Military Government. By KARL BRANDT, in collaboration with OTTO SCHILLER and FRANZ AHLGRIMM. (Stanford, Food Research Institute, Stanford University Press, 1953, xxxiv, 707 p., $10.00).

This is a collection of country reports of the record of Nazi management of Europe's agriculture during the 1939–45 war. It is based primarily on German records and on special reports written after the war by former German officials. This approach has the important merit of letting those who served in the programs tell what was done. For many of the countries it cannot be otherwise, for only the German occupiers could have recorded what was happening in the chaotic occupation years.

On the debit side, the product is uneven, and the point of view, by the nature of the source materials, is one-sided. The editors have obviously struggled with these problems, and succeed in giving some unity to a period and situation fundamentally unsuited to systematic treatment.

Perhaps the most surprising conclusion is that "Denmark, Holland, and France together proved to be a source of food imports contributing almost as much—21.4 million tons—grain equivalent [to the German war machine] as did the eastern and southeastern countries combined: 22.1 million tons" (p. 612). The millions of tons of foodstuff that Hitler sought from the grainfields of Poland, the Ukraine, and the Danube basin simply did not materialize. Here is an important lesson: the highly complex import-export oriented livestock economies of western Europe proved better able to adapt to the crises of war than did the potentially productive but less developed agriculture of eastern Europe.

The account of German efforts to reorganize Russian agriculture is intriguing. On the whole, they retained the organizational apparatus of the collective farms, although on paper many were broken up and the peasants given promises of title to land. A strong argument is made that this failure to give the land outright to the peasant members at the outset was one of the crucial errors of Hitler's war. Although equipment for new private farms was lacking, and the managerial capacity of kolkhozy members can be seriously doubted, still the basic reasons for retention of collective operation were not production considerations but Nazi desires for food for the Reich. It was easier to organize food collection from a few big farms than from millions of small ones. This points up the basic flaw in Nazi domination of eastern Europe: the needs and desires of the occupied peoples were ignored. Save for Slovakia, which received comparatively mild treatment, the rest of eastern Europe was looked upon as a subordinate colony, fit only for exploitation.

One theme of the book is the opposition to Hitler by conservative army officers, civilian specialists, and some of the German civil servants responsible for agricultural and food policy. It is persuasively argued that, had more moderate counsel prevailed, particularly in food and agricultural matters, Germany might not have lost the war in the east.

This argument may be misinterpreted. It should at least be balanced with a reading of George Fischer's *Soviet Opposition to Stalin* (Cambridge, Harvard University Press, 1952). The German dissenters from Nazi policy, Fischer believes, (p. 162) "... were not willing—or able—to pay the high price for Soviet mass support," which was the promise of full independence for a post-Soviet Russia, or more particularly the Ukraine. Fischer concludes, "... to persist in the prevailing belief that it was principally Hitler's atrocities which prevented German triumph, rather than the near-universal disregard of the Soviet population's own aspirations, is to court serious American misjudgement on how Soviet citizens can and should be approached."

An impressive feature of this volume is the systematic presentation of "food balance sheets" for Nazi-dominated Europe. The German agricultural planners developed this balance-sheet technique of food planning, and Brandt and his associates have made good use of the device in presenting their data. The statistics behind these balance sheets are often less praiseworthy. The authors give adequate warnings of these deficiencies, and yet the reader must be wary. Some of the statistics are as accurate as can be produced for any country. Others are unreliable, and often subtly misleading because of the outward appearance of completeness.

The consequences of military occupation are not easy to assay. This emerges most clearly in the treatment of German policy in France. Perhaps in no other Nazi-conquered country were as may divisive forces at work. The French people were disunited, the country was partitioned for military occupation, and the German occupation forces were themselves divided, with a concentration of opponents to Hitler in high places. The French occupation was an unhappy experience from any point of view. "The fact remains, however, that now, only a few years after World War II, there is more genuine cooperation between Frenchmen and Germans than ever before... it was made possible by the French experience with German military

government—or more precisely, with the persons in the field, their philosophy, and their conduct." (p. 568)

This study must be supplemented with reports from the point of view of the occupied countries, and this the authors clearly recognize. Despite its limitations, they have produced a solid reference work that will be of continuing usefulness to historians and economists. The German penchant for records, and their surprising availability after Germany's total collapse, have made the Nazi war effort one of the best chronicled in history. This volume will take an important place in that documentation.

Philip M. Raup, University of Minnesota.

A History of Maine Agriculture, 1604–1860. By CLARENCE ALBERT DAY. (University of Maine Studies, Second Series, No. 68, Orono, The University Press, 1954, ix, 318 p., $2.50).

Students of early agricultural history in the United States will find much useful information in this book, the principal virtue of which is its great quantity of interesting detail. The author professes to no training in historical research and writing, yet he has performed a valuable work in producing this record of Maine agriculture from early colonial times to 1860. The narrative is comprehensive in its scope, and it is presented in a readable if somewhat naive style.

The central theme of this study is the endless struggle to adapt agricultural methods and crops to constant change resulting from outbreaks of plant disease and insects, a capricious climate, and from competition of a growing West. Maine farming was largely a way of life rather than a business enterprise and the author has rounded out the agricultural picture by occasional excursions into related economic activities such as lumbering, fishing, starch manufacturing, and ship building. The story centers mainly around the settlements in the lower river valleys and in the narrow fringe of townships along the coast where the population was largely confined.

Maine was encumbered with the ever-growing problem of the abandoned farm resulting from outmigration. This phenomenon doubtless provided a strong impetus for improved agriculture in a region whose economic health depended upon effective utilization of soil resources. Large areas of the state had reverted to grazing by 1820, and reflecting this situation was a legislative bounty in the 1830's, paid to growers of wheat and corn.

This challenge to a declining agriculture resulted in some noteworthy achievements on the part of Maine reformers. These included the organization of one of the earlier agricultural societies in the United States, founded at Kennebec in 1787, and the Gardiner Lyceum which opened in 1823 and which is said to be the first agricultural school in America.

The book is marred by numerous typographical flaws which betray inadequate proof-reading. Also the historian will note several errors in dates, such as those found on page 30 for the colonial wars. The bibliography is useful only for the printed secondary sources, for it suffers from limited use of newspapers, periodicals, and manuscript material.

James C. Bonner, Georgia State College for Women

Cow Country Cavalcade—Eighty Years of the Wyoming Stock Growers' Association. By MAURICE FRINK. (Denver, Colorado, The Old West Publishing Co., 1954, xvl, 243 p., illus., index, $4.50).

Maurice Frink has prepared a well written, readable history of the stockman and his problems in the plains, valleys, and mountains on the roof of the U. S. A. More fortunate than his predecessors in his materials, he has had access to the entire historical records of the Wyoming Stock Growers' Association, due to the death of the final survivor of the so-called Johnson County War of 1892. Not much has been added in new material, but an excellent opportunity has been afforded him to get the perspective of the industry as viewed contemporaneously—with its "Beef Bonanza" aspects so effectively proclaimed in 1881 by General James S. Brisbin.

Throughout the first part of the book his journalistic training seeks headline material, with an appeal to cattle sense disregarded. However he condenses the Texas-northward cattle trailing into proper proportion in comparison to most of the wealth of subject matter, and for the first time in a cattle history emphasizes the importance of the drives from Washington, Oregon, and northern California. His story though is that of a reporter and a small class of studious cattlemen will be disappointed by the somewhat cursory treatment of many hitherto hidden points when such fine material was made accessible.

His book is divided into ten parts dealing with the short grass country (including the probable original of the story about the draught oxen turned loose in the fall for weakness and gathered sound and fat in the spring on Wyoming's buffalo and grama grasses); the coming of the cattle; the cowmen "throw in" together; rustlers and running irons; Old Cheyenne; sheep and other troubles (emphasizing the fact that sheep and cattle under one ownership made no trouble); the Johnson County War; the drought; Wyoming women; the curse of the West (federal controls and snowy winters especially 1949); and "Even the Cows are Different"; a cleanup chapter that left this reviewer laughing so at memories of "Missou" Hines that it took a half hour to recover. The author missed Missou's political promotion of himself as candidate for dog-catcher to offset and limit some wordy candidates in other fields, after he realized that the toastmaster, Senator Pat Sullivan, as a politician, could not restrict fellow candidates to five minutes only. Under Wyoming Women he apparently did not know of Mrs. Pat Quealy's heroic dragging of herself a half mile through

the snow, with a broken leg, after her automobile overturned, to telephone for help for others in the car. Wyoming women were the first to gain suffrage—they probably were the first to deserve it.

His mention of great names in the industry is to be commended—from J. W. Iliff and Nelson Story through Hi Kelly, Tom Sun, and Alexander Swan to Judge Carey and Colonel Coffee. There were many more—selectivity means nothing where all successful men are really executives.

Troubles with the Indians were numerous but troubles with rustlers were almost overpowering. Stock detectives led to stock inspectors; stock inspectors worked at the big markets, the country and auction markets, and when necessary at rail loading points. Wyoming cooperated on brand inspection at the big markets with other associations—Nebraska, Colorado, Montana, the Dakotas—and finally its tireless secretary, Russell Thorp, organized brand inspection for all state groups belonging to the American Cattle Association.

The historical committee of the association—Charles A. Myers (deceased former president); Joe Watt; and J. Elmer Brock (recently deceased former president and chairman of the committee) deserves plenty of praise for its viewpoint and guidance. In their foreword they said that in "the cattle business . . . there exists more of potentially adverse circumstances than in almost any other human endeavor. Rewards for courage, industry, and perseverance are uncertain, but lack of these, in great abundance, assures failure. A man who has been able to stay in the cattle business for fifty years must possess outstanding qualities. For each such man a hundred contemporaries quit. . . .These men represent America at its best." And this *was* the American way.

Edward N. Wentworth

Mortgage Lending Experience in Agriculture. By LAWRENCE A. JONES and DAVID DURAND. (National Bureau of Economic Research, Studies in Agricultural Finance, No. 1, Princeton, Princeton University Press, 1954, xxii, 234 p., $5.00).

Law and Practice in Chattel Secured Farm Credit. By GLENN R. COATES. (Madison, University of Wisconsin Press, 1954, vii, 105 p., $2.75).

Lawrence Jones and David Durand explain that their main purpose has been "to determine some of the important causes of farm mortgage distress" (p. xi). Considering the statistical materials which are available for the period before 1920 to be inadequate, they have confined their study mainly to the inter-war years. First, they sought to locate the "mortgage trouble spots" of the 1920's and 1930's and those regions where mortgagors were more successful than average, identifying the economic or climatic factors which appeared responsible. In a second section they discussed the variations among farm businesses within a region or type-of-farming area and their relation to differences in mortgage experience.

Statistics showing distress transfers in the states and a sampling of counties, analyses of the lending experience of agencies sponsored by the federal government and of a number of insurance companies, and figures showing bank failures, fluctuations in deposits, and trends in farm real estate values provided data which the authors arranged in numerous charts and tables to show success and failure patterns. Agricultural economists have produced many regional types-of-farming studies and farm-credit investigations and on these also Jones and Durand relied heavily.

Jones and Durand concluded that mortgage distress resulted generally from the wartime real estate boom and two subsequent slumps. Admitting that natural hazards or other local factors accentuated distress in given areas, they argue that the greater degree of failure in certain regions as compared to others and on certain land classifications within specific regions stemmed basically from the failure of lenders and borrowers to understand clearly the limitations on agricultural production in the less-favored regions or land classes. Loans and terms of repayment were arranged which the farmers could not meet, given the limited productivity of their farms. F. F. Hill and other agricultural economists stamped with the Cornell brand have long held this idea.

This book is valuable as a critical synthesis of much scattered material. Unquestionably it will reward investigation by the historian. Basically the book is a study of causal factors but these are not wrenched completely out of historical context. Mortgage distress has been recurrent in American history and a clearer understanding of the reasons why farmers have failed to meet mortgage indebtedness in the recent period should help historians in making more meaningful their accounts of agrarian distress prior to the first World War. The list of developments which have modified the price and production hazards of farming since 1914 (pp. 195–97) should be digested by every teacher who tries to explain the place of agriculture in today's America. Technical terms are used with restraint and ample definition.

The reader should remember, however, that Jones and Durand write essentially from a business point of view. Implicitly they draw the moral that in less-favored areas, smaller loans, or no loans at all, will prevent mortgage trouble spots from developing in times of depression. True enough! But we will not have solved the problems of the marginal farmer simply by denying him credit.

The task which Glenn R. Coates set for himself was a more limited one than that attempted by Jones and Durand. His competent little study is an analysis of the laws governing farm chattel credit in Wisconsin, the judicial interpretations by which they were clarified

and the modifications in actual lending practices which the statutes and judicial interpretation have produced. Wisconsin chattel law is still based to a considerable extent on the principles that "a man cannot grant or charge that which he hath not," that free disposition or exchange of collateral in the hands of the debtor should be prevented and that a public foreclosure sale should be held when a debtor is unable to meet his obligations. Coates concluded that these principles should be modified in the light of current conditions. His essay is further proof of the theorem that statutory procedure and actual practice may be greatly at variance. Chattel credit is a subject which has long needed a historian. He who aspires to the role or who simply wishes to broaden his knowledge of this field of farm finance will find here an able if somewhat tedious exposition of important principles and problems.

Allan G. Bogue, State University of Iowa

NEWS NOTES AND COMMENTS

ECONOMIC HISTORY ASSOCIATION

The Economic History Association, with which the Society has had joint membership arrangements since the Association's founding, has found it necessary to increase its membership fee by one dollar. A joint membership in the Association and Society is now $9.00, and a membership in the two and the Economic History Society of England is $12.00.

NETHERLANDS AGRICULTURAL HISTORY YEARBOOK

The Netherlands Institute for Agricultural History, Groningen, has issued the second volume of *Historia Agriculturae* as its Yearbook for 1954. The volume is made up of a bibliography of books and articles on agricultural history published in 1951, arranged by geographical areas discussed, and a continuation of replies to a questionnaire sent to farmers by the Netherlands government in 1800.

REPRINTS

The Agricultural History Society has reprints of many articles from past issues priced at 25¢ per single copy. In order to make them available for class use, additional copies are 5¢ each. If interested, ask the Secretary-Treasurer, Wayne D. Rasmussen, U. S. Agricultural Marketing Service, Washington 25, D. C., for a list.

ACTIVITIES OF MEMBERS

Vernon Carstensen of the University of Wisconsin discusses "An Early Grave Snatching Incident," *Palimpsest*, 35: 501–510 (December, 1954).

Emily E. Clark, a long-time member of the Society, has retired from the Department of Agriculture where she served for a number of years as budget officer for the Bureau of Agricultural Economics. Miss Clark plans to divide her time between Washington, D. C., and California.

Marshall Harris, Agricultural Research Service, U. S. Department of Agriculture, is to be stationed at the Agriculture Law Center, State University of Iowa, where he will supervise cooperative research on the interrelations of legal institutions and the attainment of economic objectives in Agriculture.

James C. Malin of the University of Kansas has been freed of teaching responsibilities to devote full time to research and writing.

William G. Rector, formerly of Southern State Teachers College, Springfield, South Dakota, has joined the history staff of Wisconsin State College, Superior.

Joseph C. Robert, president of Coker College, Hartsville, S. C., has been elected president of Hampden-Sydney College, Hampden-Sydney, Virginia. He will assume his new duties on August 1, 1955.

Earle D. Ross, past president of the Society, discusses "The College Textbook in American History Before the War Era," *Social Studies*, 46: 14–21 (January, 1955).

Paul F. Sharp of the University of Wisconsin discusses "Merchant Princes of the Plains," in *Montana Magazine of History*, 5: 2–20 (Winter, 1955).

Carl C. Taylor of the Foreign Operations Administration discusses "The Family Farm in the New Society," *Rural Sociology*, 19: 271–280 (September, 1954).

Mildred Throne of the State Historical Society of Iowa has edited "A Commissary in the Union Army: Letters of C. C. Carpenter," in *Iowa Journal of History*, 53: 59–88 (January, 1955).

Bennett H. Wall of the University of Kentucky is spending the current year in collecting manuscript materials for the University Library.

Harold T. Pinkett of the National Archives is the author of "Early Agricultural Societies in the District of Columbia," *Records of the Columbia Historical Society of Washington, D. C., 1951–1952*, 51–52: 32–45 (1955).

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